ENGINEERING
LIBRARY

SEP 30 1947

Paper TRADE JOURNAL

REG. U. S. PAT. OFF.

VOLUME 125, No. 13 SEPTEMBER 25, 1947

WOOD PULP

G

Established 1886

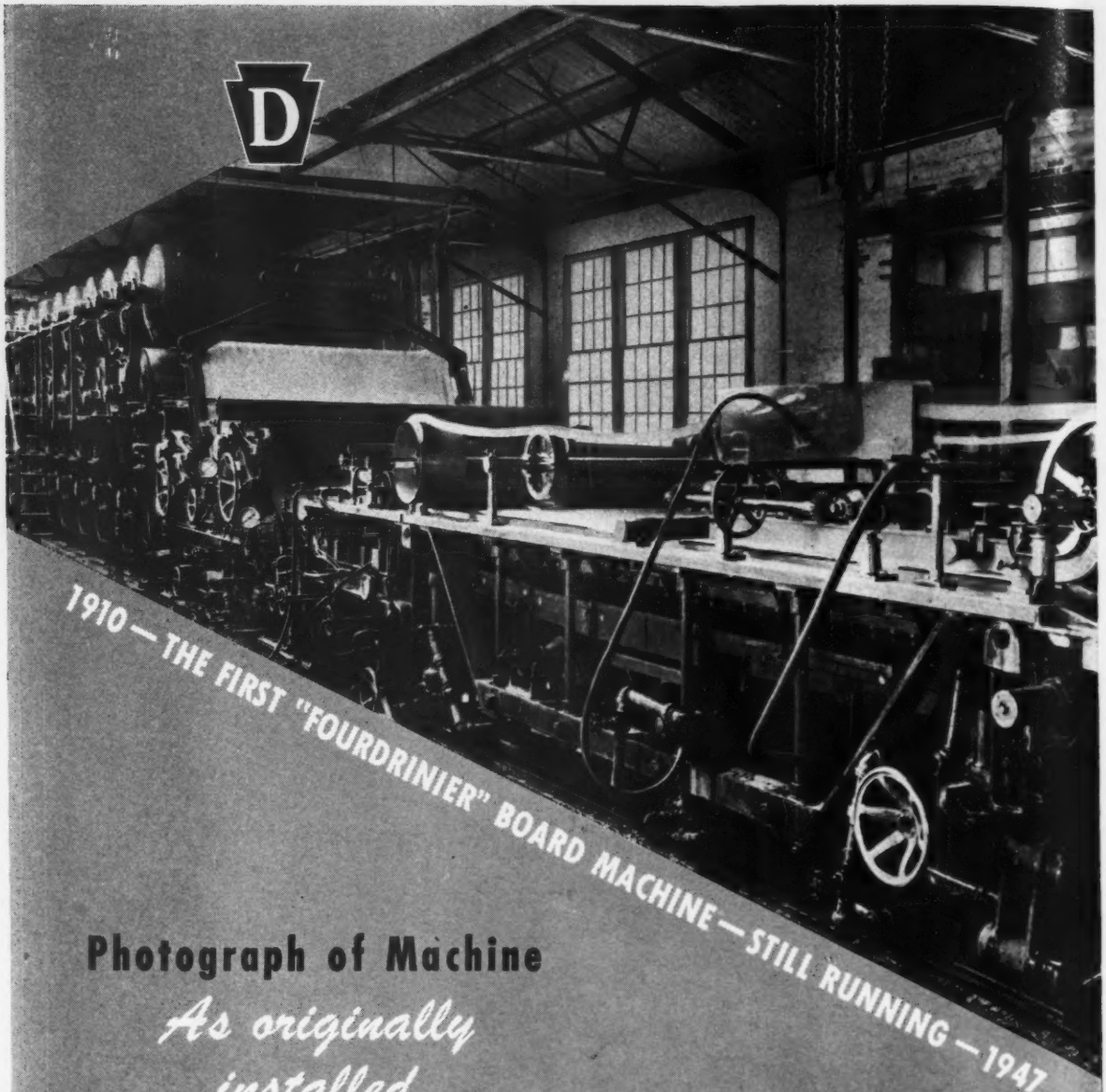
"What a time! What a civilization!"
CICERO

The present era, too, brings forth deserved expressions of admiration and wonderment. And Paper, the omnipresent servant of all mankind, has done much to create today's civilization.

We are grateful for an association of more than sixty years with the American Pulp and Paper Industry.

GOTTESMAN & COMPANY
— INCORPORATED —
22 EAST 40th STREET • NEW YORK 16, N. Y.
EUROPEAN OFFICES: Birger Jarlsgatan 8, Stockholm, Sweden

75th ANNIVERSARY



Photograph of Machine

As originally installed 37 years ago

Designed and Built by us for
HINDE & DAUCH PAPER CO.
SANDUSKY, OHIO

This "pioneer" Fourdrinier board machine was originally designed for a speed of 175 feet per minute. Of course, over the years greatly increased speed was made possible by many improvements in the original machine, such as Downingtown Suction Rolls, Downingtown Spiral Bevel Gear Drive, etc. The 37 year service record of this veteran tells its own story of quality construction.... If you're thinking of a new machine, write us. Downingtown Manufacturing Company, Downingtown, Pa.

DOWNINGTOWN

Designers & Builders
Paper Making Machinery

IN THIS ISSUE

SEPTEMBER 25, 1947

Pulp Brotherhood To Comply With Taft Law.. 9
Canada De-Controls Prices On Domestic Wood Pulp 9
E. W. Zabriskie Joins Crown Zellerbach..... 10
Eagle Lodge Elects Zakrewski President 10
Union Bag & Paper Opens Box Plant 12
Newspapers Slightly Increase Inventories 12
Dixie Cup Readies Plant At Fort Smith 12
Professional Group Begin Fall Meetings 14
Superintendents Plan Northwest Program 14
FINANCE 16
Western Sapeyes End Tournament Season ... 18
St. Joseph's Expands Its Paper Course 18
Waste Dealers Plan For Busy Convention 18
Congress Awards Contracts For Fourth Quarter's Paper 20
IMPORTS 24
TRENDS 26
PRICES 28
MARKETS 30
Western Sapeyes End Tournament Season ... 18
PRODUCTION RATIO REPORT 50
EDITORIAL 51
CLASSIFIED ADVERTISING 70

Technical Section ("TAPPI")

Experiments on the Grinding of Quaking Aspen and Use of Pulp in Printing Paper 53
Pacific TAPPI Meets at Longview 63

INDEX TO ADVERTISERS ON PAGE 86

Volume 125 — **Number 13**

Paper TRADE JOURNAL
REG. U.S. PAT. OFF.

Executive and Editorial Offices: 15 W. 47th St., New York 19, New York
Published Every Thursday by Lockwood Trade Journal Co., Inc.

GEO. E. LOCKWOOD, *President & Treasurer* ARTHUR E. GORDON, *Vice-President* JOSEPH P. HORGAN, *Secretary*
W. L. COOK, *Editor* • HARRY I. JENSEN, *Assistant Editor* • R. G. MACDONALD, *"TAPPI" Editor* • F. B. GROSSE, *Production Manager*

Eastern Representatives
BRUCE E. BROWN
15 W. 47th St., New York 19, N. Y.; Phone BRyant 9-0860

Pacific Coast Representatives
EDWARD H. DOERING
15 W. 47th St., New York 19, N. Y.; Phone BRyant 9-0860
ROY M. McDONALD & CO.
San Francisco, 4, Cal.; 564 Market St.
Los Angeles, 5, Cal., 639 S. Wilton Pl.; Seattle, 1, Wash., First & Virginia

Mid-Western Representatives
H. K. VINTON
123 W. Madison St., Chicago 2, Ill.; Phone RANdolph 4780

FRANKLYN H. OLSEN
1674 Sunview Rd., South Euclid, Cleveland, 21, Ohio; Phone: Hillcrest 1124-W

Representative for Denmark, Norway, Sweden and Finland
OXFORD TRADING AKTIEBOLAGET
Bibliotekgatan 6-8, Stockholm, Sweden

Subscriptions: (Payable in advance) By the year, $5.00; Single Copy 15 cents *Postage Extra: To Canada, $2.00; To Other Foreign Countries, $3.50.* Member Audit Bureau of Circulations.

PAPER *established Feb. 17, 1899, combined with* PAPER TRADE JOURNAL, *Nov. 16, 1899.* PAPER *established Sept. 21, 1910, combined with* PAPER TRADE JOURNAL *Feb. 19, 1926.*

All rights to the above titles reserved.

PAPER TRADE JOURNAL *is entered as Second Class matter at the Post Office at East Stroudsburg, Pa., under Act of Congress of March 3, 1879. Publication Office at Lockwood Trade Journal Co., Inc., 34 N. Crystal St., East Stroudsburg, Pa. Printed in U. S. A.*

Copyright 1947 by the Lockwood Trade Journal Company, Inc. The contents of PAPER TRADE JOURNAL *including all articles, illustrations, etc., are covered by copyright and may not be reprinted except by permission.*

PAPER TRADE JOURNAL *is indexed in Industrial Arts Index.*

CALENDAR OF COMING EVENTS

September 25-26, 1947—TAPPI Plastics Meeting, New State College of Forestry, Syracuse, N. Y.

October 4-6, 1947—National Association of Waste Material Dealers, Inc. Fall Convention, Hotel Ritz-Carlton, Atlantic City, N. J.

October 9-11, 1947—TAPPI Alkaline Pulping and Chemical Products Meeting, Asheville, N. C.

October 23-24, 1947—TAPPI Fibrous Agricultural Residues Meeting, Alton, Ill.

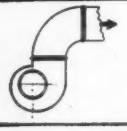
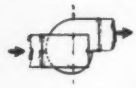
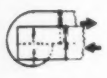
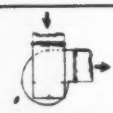
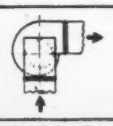
October 27-29, 1947—The National Paper Trade Association of the U. S., Inc., Semi-annual Convention. Hotel Sherman, Chicago.

November 3-5, 1947—TAPPI Second Engineering Conference, Philadelphia, Pa.

May 18-20, 1948—American Pulp and Paper Mill Superintendents Association, Annual Meeting, Roosevelt Hotel, New Orleans, La.

Cut "ELBOW LOSSES" IN YOUR AIR DELIVERY!

See How "Buffalo" LIMIT-LOAD FANS PERFORM WITH DIFFICULT CONNECTIONS

Obstruction		Percent Reduction in Capacity		
		Static Pressure	Buffalo Type "LL"	Competitive Forward Curve
	Elbow on fan outlet	1"	3%	7%
		¾"	3%	7%
		½"	3½%	11%
	Elbow on inlet from left side	1"	2½%	8½%
		¾"	2%	11%
		½"	3%	17½%
	Elbow on inlet from right side	1"	1½%	5%
		¾"	1½%	6%
		½"	2½%	7%
	Elbow on inlet from top	1"	2½%	5%
		¾"	2%	6%
		½"	3%	7%
	Elbow on inlet from bottom	1"	1½%	5%
		¾"	1½%	6%
		½"	2½%	7%

Note—Data is based on a fan outlet velocity of 1600 feet per minute.

Often, when space considerations call for installing a fan with elbow connections either on inlet or outlet, static pressures go up! You're paying for more power and less delivery.

However, you can cut these pressure losses to a very substantial degree with Buffalo Limit-Load Fans in such spots.

The table at left shows, by actual pitot tube readings at 1600 cfm outlet velocity, the way these Buffalo Fans can step up the efficiency in your air system.

Why not let Buffalo Limit-Load fans save you money? Simply write us for Bulletin 3339, which gives you all ratings, capacities and construction data on these quiet, trouble-free fans.

BUFFALO FORGE COMPANY
159 Mortimer St. Buffalo, N. Y.
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

"Buffalo" Limit-Load FANS

Paper TRADE JOURNAL

VOL. 125, NO. 13 REG. U.S. PAT. OFF. SEPTEMBER 25, 1947

Pulp Brotherhood to Comply With Taft Law

MILWAUKEE, Wis. — Even if it brings the union into conflict with the American Federation of Labor's executive board, the International Brotherhood of Pulp, Sulphite and Paper Mill Workers will comply fully with the terms of the Taft-Hartley law, according to John Burke, Fort Edwards, N. Y., president of the union.

Burke addressed the union at its twenty-first annual convention here last week. He emphasized that the union disapproved and would work for repeal of the law, and he advocated defeat of the congressmen who voted for it.

The executive board of the union asked the AFL executive board to sign non-Communist affidavits, in a telegram to AFL President William Green. Failure to do so, the telegram said, was giving "aid and comfort to the Communists." It added that the issue involved "does not seem to us to be a very important one."

The union's action followed closely the failure of the AFL executive board to approve the signing of such affidavits.

Burke refused to have his salary almost doubled. "The trade union movement is a service organization," he said. "The $6,500 a year I'm getting now is not a starvation wage." The union's constitutional committee had proposed an increase to $12,500, but acceded to his request. It boosted salaries for vice-presidents and treasurer to $110 weekly and for international representatives to $100.

A resolution, introduced by the Camas, Wash., Local No. 100 asked that the International "notify all employers having contracts with this union that no member of this organization will work . . . next Election day."

The holiday, the resolution pointed out, would be in cooperation with the proposal by AFL President Green for a nationwide demonstration of affiliated locals on Election day to defeat the sponsors and supporters of the Taft-Hartley law.

Despite considerable opposition, primarily from southern and Canadian mills, the union voted to increase its dues 15 cents monthly. The original proposal was to raise the per capita dues by 20 cents, making them 80 cents a month. The vote was more than two to one among the 500 delegates present.

(Continued on page 48)

Canada De-Controls Prices On Domestic Woodpulp

WILLIAM R. BARBER

Crown Zellerbach executive who has been elected Vice-President of the Technical Association of the Pulp and Paper Industry.

TAPPI Names Barber To be Vice-President

NEW YORK—The Executive Committee of the Technical Association of the Pulp and Paper Industry has selected William R. Barber, technical director of the Crown Zellerbach Corporation, Camas, Wash., to fill the office of vice-president of the Association, which became vacant when W. F. Gillespie became president following the untimely death of the incumbent, Worthen E. Brawn.

This action by the Executive Committee was authorized by Art. V., Sec. 5, of the Association's Constitution.

Mr. Barber has been a leader in Technical Association activities for several years, particularly in advancing the interests of the TAPPI Pacific Section. He will serve as vice-president for the balance of the administration year, ending in February 1948.

TORONTO, Ont. — Last week-end the Canadian Government Wartime Prices and Trade Board took another long step towards de-controlling the industrial and commercial economy by releasing from control a long list of products and services and discontinuing the payment of subsidies. As a consequence the cost of living index takes the largest single jump since controls were inaugurated in 1942 — up four points.

Among the products de-controlled was woodpulp which will result in a $10 a ton increase in the domestic price of some types of wood pulp, which will be reflected in some papers and paper products. Sulphite for paper and paper board increased $10 a ton on September 15 and bleached sulphite and soda pulps were being increased by the same amount. Unbleached sulphite is expected to go up a similar amount by October 1.

Prior to de-control, pulp men stated, on the average domestic prices were $20 to $30 a ton below the United States market price. Current quotations show a difference of $115 a ton against $94 in Canada.

Canadian wood pulp consumption last year was slightly more than five million tons, 4.2 million tons of which went into newsprint for domestic use. The price increase will not represent any large gains for most Canadian companies.

Fine papers were also de-controlled, but Canadian producers have decided to continue to adhere to the provisions of Order A-1000 for the time being in an effort to maintain supply at as high a level as possible. Order A-1000 generally limited ceiling weights on the products of most of the firms making papers, and also restricted colors, sizes, embossing, etc., to essentials. It unquestionably worked to increase the quantity of sheets available to Canadian users, according to manufacturers. To the extent that the manufacture of many additional items is resumed, the quantity of sheets available would be reduced. Consequently, although they say there are many reasons why they would prefer to go back to producing a more normal line, the fine paper

(Continued on page 47)

E. W. Zabriskie Joins Crown Zellerbach

CARTHAGE, N. Y. — Emmett W. Zabriskie, a native of Ogdensburg and graduate of St. Lawrence University, recently employed by the Davidson Chemical Company at Baltimore, Md., has been named to the post of industrial engineer at the National Paper Products Company of Crown Zellerbach Corporation.

Announcement of Mr. Zabriskie's affiliation with the local organization was made known by R. J. Schadt, resident manager of the corporation's interests here.

Formerly employed by the Talon Corporation at Meadville, Pa., and later by the Aluminum Company of America, Massena, Mr. Zabriskie during the war years was associated with the Friez Industrial Division of Bendix Aviation Corporation at Baltimore, Md., and until assuming the post as industrial engineer at the National Paper Products Company, was with the Davidson Chemical firm at Baltimore.

An alumnus of St. Lawrence University, Mr. Zabriskie received his bachelor of arts degree in economics there in 1937. Affiliated with Phi Sigma Kappa, social fraternity, he was a member of the wrestling team for four years and during his senior year was listed in Who's Who in American Colleges and Universities.

During his association with the Maryland chemical company, he served as vice-president of the Baltimore chapter of the Engineers' Society of Advancement of Management, a national organization devoted to the scientific study of management in industry.

Southern Paperboard Names Paymaster

SAVANNAH, Ga.—Cary W. Anderson, well known Savannahian, has been named as paymaster for the Southern Paperboard Corporation.

Mr. Anderson has just returned from Haverhill, Mass., where he spent three months in the payroll department of the Robert Gair Company mill familiarizing himself with the company's payroll procedures.

Up until last January Mr. Anderson was chairman of the board of city tax assessors, a post he had held for ten years. Before that he was in the Tax Receiver's office at the Court House for four years.

Butterfield Joins Black-Clawson

HAMILTON, Ohio — The Black-Clawson Company has appointed C. H. Butterfield to be a member of the sales staff at the Hamilton Division. As the fourth generation of a family of paper mill operators, Mr. Butterfield comes to The Black-Clawson company with twenty-eight years of paper mill experience in mill operation and engineering.

Graduating from the University of Cincinnati as a mechanical engineer, Mr. Butterfield is a registered professional engineer and a member of the National Association of Professional Engineers as well as TAPPI.

Schmalz Tells Rotary How Paper Is Made

KAUKAUNA, Wis.—Steps in producing paper were outlined recently by A. M. Schmalz, supervisor at the Thilmany Pulp and Paper Company, in a talk before the Rotary club, preparatory to a tour by the club through the Thilmany mill.

Schmalz explained how water is evaporated from paper as it goes through the machine and how waste water is reclaimed and filtered to be used again. He also mentioned recovery of various by-products, such as turpentine and sulphate skimmings which are used in tall oil which is a vegetable oil used in foundries, where it is mixed with sand.

The use of fiber glass and rayon string in paper also was outlined by the speaker, who mentioned that one of the bag machines has a capacity of 48,000 paper bags an hour.

Detroit Sulphite Pulp Advances Schnaufer

DETROIT—The Detroit Sulphite Pulp and Paper Company has appointed Martin F. Schnaufer to the post of chief engineer, succeeding Ernst Gschwender, who recently retired after almost thirty-four years' service with the company. Mr. Schnaufer has been associated with Detroit Sulphite for the past seven years and was formerly plant engineer.

Bachman Elected Head By N. E. Superintendents

POLAND SPRINGS, Me.,—Albert E. Bachman, superintendent of the Missisiquoi Corporation, Sheldon Springs, Vt., was elected chairman of the American pulp and paper superintendents northeast division late last week. He succeeds George D. Fuller of Boston. Mrs. Marian L. Stewart of Lincoln, N. H., was re-elected secretary-treasurer.

Great Northern Elects Trask To Its Directorate

BOSTON—Frederick K. Trask, Jr., has been elected a director of the Great Northern Paper Company. Mr. Trask is a general partner of Payson & Trask and formerly was vice-president of Farmers Deposit National Bank of Pittsburgh.

Eagle Lodge Elects Zakrewski President

HOLYOKE, Mass.—Edward Zakrewski is the new president of Eagle Lodge of Papermakers No. 1 as a result of a shift in leadership at the union's regular meeting held recently.

Zabrewski, who has been vice-president, takes over the presidency from Robert C. Cameron, who resigned. William McFadden resigned as recording secretary because of his inability to devote the necessary time to the office and Cameron was elected recording secretary. The vacant vice-presidency was filled by the election of Edward Marchand.

The sickness and accident insurance coverage, agreed upon in the new contract signed during the summer between the union and paper mill managements, has already gone into effect at the Parsons, Valley and Carew companies and will be in effect at American Writing Paper Corporation by Oct. 1, it was announced. The Crocker-McElwain and Chemical mills already had such a plan before the new contract was negotiated. Details of the insurance plan being adopted by the Franklin Paper company were to be ironed out this week.

Election of international officers of the AFL union is scheduled for Oct. 5. Secret ballots will be used. Edward M. Moore of this city, union organizer, is a candidate for sixth vice-president and has the endorsement of 26 locals in the Western New England area where he is organizer.

Cvengros Wins Mahler Cup In Kimberly Tournament

NEENAH, Wis.—Steve Cvengros has won the Ernst Mahler "A" flight championship in the annual Kimberly-Clark golf tournament by defeating Joe Spilski 2-up. Other champions, determined earlier, include John Bletzinger in the S. F. Shattuck "B" flight, and Elmer Quayle in the KCA "D" flight.

Still to be named are champions in two flights. In the F. J. Sensenbrenner championship flight, Bill McGuire and Chet Bland are the finalists, while in the Harry Price "C" flight, the choice is between H. Cragg and F. Wilton.

Courchane Leaves Mill To Start Own Business

KIMBERLY, Wis. — A. J. (Dud) Courchane left his position September 24 as safety director at the Kimberly mill of Kimberly-Clark Corporation, in order to enter business at Bonduel, Wis. He began his duties as the first Kimberly mill safety director in 1933, and held it since except for the time he served in the navy in World War II. He was also secretary of the village water commission and vice commander of the local American Legion post, both of which positions he has resigned.

Hairline Accuracy... and No "Face-Drag"...

...when you Cut Paper with

SIMONDS S-301 KNIVES

These knives are precision-ground for face clearance like the blades of a pair of scissors. And Simonds special S-301 papercutting steel holds a superkeen edge longer than you ever thought possible in any paper knife. So there's no face drag against the stock . . . which means you're sure of clean, effortless cutting, and hairline accuracy.

And for *complete* insurance of clean-cut performance, this edge is delivered to you just the way the inspector okayed it . . . packed in wood so the edge literally "floats in air", beyond all danger of damage in transit.

Order Simonds S-301 Paper Knives from your dealer, or from the nearest Simonds office.

SIMONDS
SAW AND STEEL CO.
FITCHBURG, MASS.
Other Divisions of SIMONDS SAW AND STEEL CO. making Quality Products for Industry

SIMONDS STEEL MILLS — LOCKPORT, N.Y. — *Special Electric Furnace Steels*

SIMONDS — PHILADELPHIA, PA. — *Grinding Wheels and Grains*

SIMONDS — MONTREAL, QUEBEC, VANCOUVER — *Simonds Products for Canada*

BRANCH OFFICES: 1350 Columbia Road, Boston 27, Mass.; 127 S. Green St., Chicago 7, Ill.; 416 W. Eighth St., Los Angeles 14, Calif.; 228 First St., San Francisco 5, Calif.; 311 S. W. First Avenue, Portland 4, Ore.; 31 W. Trent Ave., Spokane 8, Washington. ***Canadian Factory:*** 595 St. Remi St., Montreal 30, Que.

Union Bag & Paper Opens Box Plant

SAVANNAH, Ga.—The Union Bag & Paper Corporation's new box factory here, equipped with the most modern corrugated and box-making machinery, went into production Friday, September 19, almost a year to the day from the time construction was started.

The plant is presently staffed by approximately 150 new employes and additional workers will be added within the next few months when machinery now on order and in the process of manufacture is installed.

The first day's operation in the plant saw the giant sized 285-foot corrugating machine turn out thousands of sheets of corrugated board, which will be fabricated into boxes within a few days, when the cutters, slitters, automatic tapers and stitchers, and printing presses and other box making equipment go into production.

The new factory building, which is of one-story steel and concrete construction, covers four acres of ground and is located within 300 yards of the city-block-long board machine that will supply it with corrugated board. The box plant is the only one in the State of Georgia operated in conjunction with a pulp and paper mill.

T. T. Dunn, resident manager of the Savannah plant, who presided at exercises marking the opening of the factory last Friday, stated that the plant will make corrugated board and corrugated shipping containers and that 400 people will be employed when full production is reached. He added that most of the persons now working in the box factory are local people, only a few experienced supervisors and skilled operators have been brought in .

In addition to the plant officials who were present at the opening of the new plant, the following Savannahians also attended: Robert W. Groves, president of the Savannah Industrial Committee, and a member of Union Bag's board of directors; Charles J. Musante, executive secretary of the Industrial Committee; and Col. E. George Butler, who was vice-president of the Industrial Committee in 1935 when the committee and the city of Savannah were successful in securing the location of the Union Bag plant at Savannah.

The box factory is one of two new production units at the plant, where an expansion and renovating program has been in progress since the end of World War II. The other unit is a fifth paper machine expected to go into production next month, making a variety of papers which the enlarged bag factory will convert into many kinds of specialty and multiwall bags, it was stated.

Remove Export Controls On Gypsum Liner Paper

WASHINGTON — Gypsum liner paper is included in a list of products on which export controls will be removed October 1, the Office of International Trade announced last week.

Requests for gypsum liner paper for export have been negligible in quantity, it was said, and decontrol is possible without creating an undue drain on domestic supplies.

Newspapers Slightly Increase Inventories

NEW YORK—Daily newsapers reporting to the American Newspaper Publishers Association had 42 days supply of newsprint on hand and in transit at the end of August 1947. This represents an increase of 1 day's supply over July 1947. These stocks of 42 days at the end of August 1947 compare with 37 days at the end of August 1946; 49 days at the end of August 1945 and 53 days at the end of August 1941.

This increase in newsprint stocks of newspapers represents a seasonal building up of reserves against the winter months when weather conditions and box car shortages may again delay shipments.

Daily newspapers reporting to the ANPA consumed 281,102 tons of newsprint in August 1947 compared with 257,303 tons in August 1946 and 224,-361 tons in August 1941. This was an increase in August 1947 over August 1946 of 9.2 percent and an increase over August 1941 of 25.3 percent.

The total estimated newsprint consumption in the United States for August 1947 was 385,071 tons which includes all kinds of uses of newsprint. For the first eight months in 1947 it is estimated to be 3,103,338 tons. During the first eight months of 1947 the reporting newspapers used 2,265,-437 tons of newsprint, an increase of 13.7 percent over the first eight months of 1946 and an increase of 18.8 percent over the first eight months of 1941.

Let Earthwork Contract On Petenwell Dam

WISCONSIN RAPIDS, Wis. — The contract for all earthwork construction involved in the Petenwell dam and hydroelectric project was awarded September 17 to Foley Brothers, Inc., St. Paul, at a meeting of directors of the Wisconsin River Power Company. The contractors were preparing to start moving equipment within a week.

Attending the meeting, which was held at Necedah, Wis., were George W. Mead, president of Wisconsin River and of Consolidated Water Power and Paper Company, William F. Thiele and Ralph R. Cole, all of Wisconsin Rapids; C. E. Kohlepp, Milwaukee; A. G. Carson, Grover C. Neff and R. G. Walter, all of Madison. The group visited the project site and inspected work already under way.

Dixie Cup Readies Plant at Ft. Smith

FORT SMITH, Ark.—The Dixie Cup Company, producing paper cups and food containers in a variety of sizes and types, is completing plans for early operation of its new factory on a 17-acre tract near Fort Smith. The building, with 120,000 square feet of space on one floor, is the newest of the company's six factories and the only one west of the Mississippi River. The nearest plant is at Chicago.

The property has a 1,200-foot frontage on Midland Boulevard and the building is virtually complete. Machinery is being shipped in and installed under supervision of Neil Kingsnorth of Chicago, who will be plant manager when operations begin.

The building has an insulated roof, heat-resistant glass windows, fluorescent lighting and automatic sprinkler equipment. A plant cafeteria, locker rooms with shower facilities, and a recreation hall for employes are included in the floor plan.

The plant's output will be marketed in the central South and Southwest.

Although the company had ten years to repay a loan of $140,400 from the Fort Smith Industrial Building Foundation secured to erect the property, the loan has been paid in full in connection with large scale refinancing at a lower rate of interest. The Foundation was established by Fort Smith business leaders in February, 1946, as a non-profit investment of 80 stockholders who wish to attract large and substantial industry of a type suitable for the area and its raw material resources.

Total cost of the Dixie plant will be $700,000.

Riegel Ups Pay By Five Per Cent

MILFORD, N. J.—A five percent wage increase for all hourly and salaried employees at the four plants of the Riegel Paper Corporation in this vicinity was announced last week by Fred I. Jacob, vice-president and general superintendent. It is retroactive to September 8.

The increase applies to employees in the mills at Milford, Warren Glen, Hughesville and Riegelsville. It is the third made by the firm this year.

Jacob said that the total salary increases since V-J Day for the firm's employees are 40 percent.

Bergstrom Buys Tract For Storage Space

NEENAH, Wis. — The Bergstrom Paper Company has purchased a tract of land south of Neenah for warehouses for raw materials and for reserve coal and lumber supplies. Increased production is resulting in the need for greater storage space.

–count on UFORMITES 467 and 470 to meet requirements at low cost

Sanitary garbage bags *must* have high wet strength properties to prevent breakage. Here, as in many other applications, the UFORMITES supply that important quality . . . efficiently, economically.

UFORMITE 467 was specifically developed for use with Kraft by beater addition. UFORMITE 470 is recommended especially for sulfite stocks but can be used advantageously with Kraft, rag and groundwood.

If you are manufacturing bags, wrapping paper, toweling, soft tissues, glassine, map, chart or ledger paper, you'll want to use these urea formaldehyde resins. Why? Because neither UFORMITE 467 nor UFORMITE 470 affects the color, odor or taste of paper. Because no special equipment or handling is required for their preparation or use. Because as little as 1% resin on dry fibre weight will increase wet strength as much as 300%. Because the UFORMITES improve dry tensile and Mullen, fold, uniformity of sizing, and coating service characteristics.

See for yourself how the UFORMITES, at low cost, can increase the value of your paper production. Write for full details today.

UFORMITE *is a trade-mark, reg. U. S. Pat. Off.*

Represented by Cia Rohm y Haas, S.R.L. Carlos Pellegrini 331, Buenos Aires, Argentina, and agents in principal South American cities.

THE RESINOUS PRODUCTS & CHEMICAL COMPANY

WASHINGTON SQUARE PHILADELPHIA 5, PA.

Professional Group Begin Fall Meetings

CHICAGO—Professional Paper Group, Chicago section of TAPPI, is going to have a record year. An unusually enthusiastic audience attended the first dinner meeting held in the dining-room of the Chicago Bar Association on Monday evening, September 15. The panel discussion type of program which has become a fixture with the Group, featured the evening's speaking program which was prefaced by the usual good dinner. Subject for the panel was "Paper and Paperboard as Bulk Packaging Materials" and special emphasis was given to the construction and usage of corrugated cartons, multi-wall bags, fibre drums and their advantages and limitations.

With President Kubicka doing an excellent job of presiding, five well known figures in the container and allied field contributed to the excellent discussion which provoked some excellent interest from the audience as evidenced by the questions put to the speakers.

Outlining the requirements of durability and weight as well as size requirements, A. L. Green, special representative of the Freight Claim Division of the Association of American Railroads, led off in the discussion. His remarks permitted the audience to better understand the problems of the railroads and called attention to some of the performance demanded for safety and less cost of transportation.

The second speaker was E. R. Bolman, sales manager, Paper and Laminated Products Division, Chase Bag Company. Mr. Bolman exhibited and adequately described the application of various types of paper to multi-wall paper bags, paper open mesh bags, crinkled and smooth duplex papers, waterproof paper-lined bags and lined duratex bags. He had samples of each item and generously explained their application in the entire flexible container field.

Testing methods and performance standards of shipping containers were described by Charles J. Zusi, vice-president of Container Laboratories, Inc. Mr. Zusi briefly traced the purposes of the Container Laboratories, outlined the types of laboratory work performed, mentioned some of the developments of recent years and told his audience something of what is to be asked of the container of the near future and its potential usages.

From outlying Kankakee, Illinois, A. J. Godschalk, sales manager of the Fibre Drum Company, discussed fields of usage for solid fibre drums and pails and explained the use of linings and interior bags and liner for protection of various contents that may be packed in these containers. He furnished samples for both illustration and inspection by the audience.

The final speaker was Paul Meelfeld, advertising and sales promotion manager of the Hinde & Dauch Paper Company, who outlined new developments in design of corrugated shipping boxes for all forms of transportation, including air freight. He also presented samples of containers to outline his points and his discussion covered display boxes, dual use packages and new types of wrapping and packaging materials.

In summary, each speaker was clearly sold on the immediate and future possibilities of the container, believing that war experiences coupled with a tremendous amount of exploratory and research work had now readied the industry for its greatest expansion days into new fields not alone as a container with many splendid shipping attributes but as an advertising medium as well.

Badger Globe Mill Fetes George Casperson

NEENAH, Wis. — George Casperson was honored recently at an informal luncheon at Lakeview mill by mill superintendents, staff and Badger-Globe executives, in observance of his 47 years of service with Kimberly-Clark and of his retirement.

He was the twentieth Lakeview mill employe to retire under the Kimberly-Clark pension program. He began working for the corporation on June 1, 1900, at the Neenah mill and was transferred to Lakeview January 1, 1930, as crepe wadding machine tender.

Other Lakeview pensioners are Kate Hussey, Frank Barto, John Hanson, Joe Schwab, Louis Asmus, William Koepke, Orrie Coats, Al Belling, John Striegel, Oscar Klausner, Carrie Hoganson, Henry Hass, Harvey Rockwood, George Roll, Belle Truscott, Fred Krablean, Herbert Paker, Louis Anderson and Abe Paulson.

Farm Co-Op To Market Members' Pulpwood

DAYTON, Tenn.— The Secretary of State has issued a charter to the Waldens Ridge Farm Co-op Association, of Dayton, which proposes to market "all timber, lumber, pulp wood and chemical wood cut by its members in preparing their lands for cultivation." The association was authorized to have a capital stock of $1,000,500, divided into 500 shares of $1 par common voting stock and 10,000 shares of $100 par preferred stock. Incorporating directors include J. Wesley Gardner, Charles W. Gardner, Marvin Milligan and others.

Atlas Tag Entertains Group in Chicago

NEENAH, Wis.—Fifteen women employes of the Atlas Tag Company spent the last weekend on an outing in Chicago as guests of the management, leaving Friday, October 19, and returning the following Sunday evening.

Superintendents Plan Northwest Program

WAUSAU, Wis.—About 225 persons, including wives of members and affiliate members are expected to attend the fall meeting of the Northwestern division of the American Pulp and Paper Superintendents' Association here September 26 and 27. The division includes Wisconsin, Minnesota, Illinois, Iowa, Nebraska and that part of Canada which directly adjoins Minnesota and the west portion of Lake Superior.

During the business session on September 27, John A. McPherson, Wausau, of the Mosinee Paper Mills Company, will speak on "Pulp Factors Influencing the Design and the Operation of Vacuum Washer Systems," and Urban C. Remmel, Clintonville, Wis., director of industrial relations for the Four Wheel Drive Auto Co., will talk on "Industrial Relations — What Next?" A movie will be shown by C. L. Durkee of the D. J. Murray Manufacturing Co. of Wausau, makers of papermill machinery, on southern wood handling in woods operation. Durkee is chairman of the affiliate members.

Durkee will be in charge of a cocktail party at the Elks club Friday afternoon, September 26, for the affiliates and their wives.

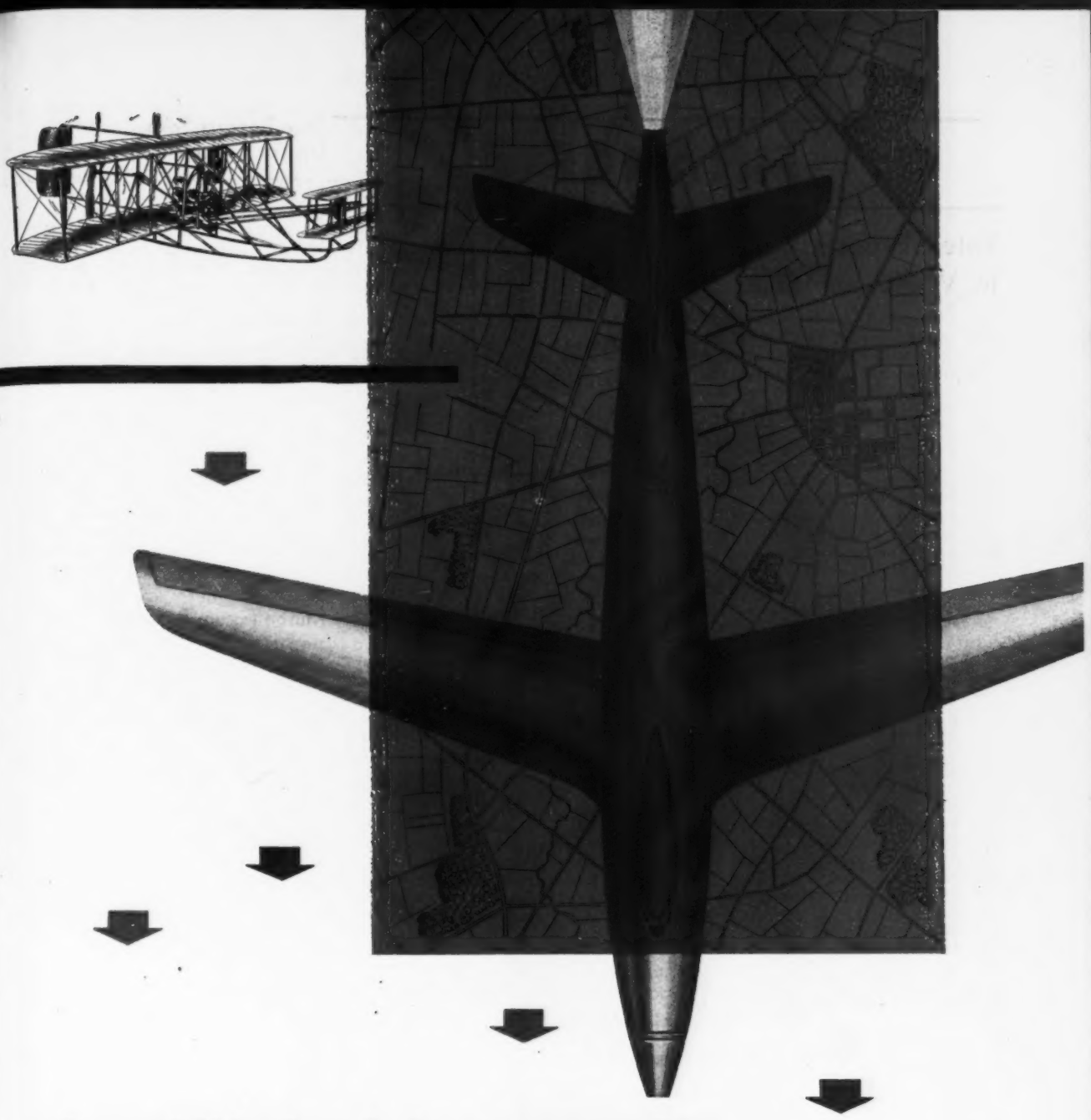
Dinner for all attending the fall gathering will follow at the Elks club, after which Lawrence Pflieger, assistant papermill superintendent at the Rothschild plant of Marathon Corporation, will entertain at a bowling party.

Harold A. Skinner, general pulp mill superintendent at Rothschild, is in charge of the golf tourney at the Wausau Country Club on September 27, which will be followed by a banquet and dancing at Hotel Wausau, and prizes will be awarded by Skinner and life memberships in the association by Charles H. Reese, Port Edwards, manager of manufacturing for the Nekoosa-Edwards Paper Company and second vice president of the national association. Two life memberships will be awarded.

The women's program of the convention provided for noon luncheon and bridge at the Wausau Club on September 27 and for participation in the dinner and dancing events during the convention.

Mill visits are scheduled for the afternoon of September 26 at the Port Edwards and Nekoosa plants of the Nekoosa-Edwards Paper Company and the Marathon Corporation mill at Rothschild and the Mosinee Paper Company at Mosinee.

Officers whose terms will expire are R. A. Nugent, Nekoosa, chairman; Sigmund Eckman, Rhinelander, first vice chairman; Frank Kreiling, Kankauna, second vice chairman, and L. S. Sabatke, secretary-treasurer.



from kitty hawk to supersonics

It took a lot of pioneering groundwork in aerodynamics to lift the first "box kite" into the air . . . and on that groundwork planes now fly at supersonic speeds. Thus is progress in every field of science and industry an extension of sound pioneering thought and action. Niagara pioneered the production of many electro-chemical products in America and through research has constantly improved their quality and efficiency as chemical tools of progress, with the result that Niagara is today "An Essential Part of America's Great Chemical Enterprise."

NIAGARA ALKALI COMPANY

60 East 42nd Street, New York 17, N. Y.

LIQUID CHLORINE • CAUSTIC POTASH • CARBONATE OF POTASH • PARADICHLOROBENZENE • CAUSTIC SODA • NIAGATHAL (TETRACHLORO PHTHALIC ANHYDRIDE)

FINANCE

Yates Expects Sag In Wallpaper Sales

CHICAGO—William H. Yates, president of the United Wallpaper, Inc., has told stockholders that demand for wallpaper is expected to continue high for the next 12 months. He said, however, that it is improbable that either sales or profits will be as large as in the fiscal year ended June 30, 1947.

Labor and material costs in the industry continue to advance and the bulk of these must be absorbed by the manufacturer, Mr. Yates stated. The firm reported a net of $1,842,344 for the latest fiscal year. This was equal to $1.46 a common share.

"Inventories in the hands of distributors," Mr. Yates added, "are now substantial, a condition that did not exist at the beginning of last year. Demand on the part of the consumer for the higher priced goods has somewhat diminished."

Mr. Yates said the new plant at Aurora, Ill., originally scheduled to cost $2 million, will probably involve an expenditure of $3,737,000.

To meet the increased cost and to maintain necessary working capital, additional borrowings will be required, according to Mr. Yates. He added that while open bank credit lines are available it has been determined that additional long-term financing will be more satisfactory.

A special meeting of the company's preferred stockholders will be held on October 7 to approve an increase in the company's permissible funded debt from $2 million to $3.5 million. The Metropolitan Life Insurance Co., it is stated, has agreed to lend the company an additional $1.5 million subject to this approval. This loan would be repayable over 20 years, with an interest rate of 3¼ percent.

Mr. Yates stated that the dividend rate of 25 cents per share, paid in the preceding year, will remain unchanged.

Gaylord Calls Debentures For Redemption

Gaylord Container Corporation has issued notice of call for redemption on October 1, 1947, of its 3¼ percent debentures outstanding in the amount of $4,400. Company's own funds will be used for this redemption. After the redemption of these debentures and the completion of the recent call of its preferred stock, the company's outstanding capital will consist solely of common stock.

Hollingsworth & Whitney Votes Fifty Cents on Common

BOSTON—Directors of Hollingsworth & Whitney Company have declared a regular quarterly dividend of $1 per share on the $4 cumulative preferred stock, payable October 1, to stock of record, September 12. Directors also declared a dividend of 50 cents per share on the common, payable September 12, to stock of record, August 29, 1947.

Sorg Reports Sales Up For First Half

MIDDLETOWN, Ohio—The Sorg Paper Company last week reported net sales for the first six months of 1947 totaled $7,436,974 compared with $5,090,987 for the same period in 1946. Net income for the period, after provision for Federal income taxes, was $743,922 compared with $167,106.

Current assets as of June 30, 1947, were $3,530,090 and current liabilities were $671,026. For the same period of 1946 assets were $2,615,949 and liabilities $1,021,840.

D. G. Driscoll, president, said the Sorg Pulp Company, Ltd., of Port Mellon, British Columbia, Canada, wholly owned subsidiary of the Sorg Paper Company, continues to supply approximately one-half of the company's wood pulp requirements. Production for the first six months of 1947 was 14,500 tons, which is greater than any other six-month period.

Milton Forum Resumes

NEW YORK — The Milton Sales Forum, inaugurated last June by the Milton Paper Company, New York paper merchants, last Friday in a series of monthly luncheon meetings devoted to the exchange of viewpoints between the company's sales staff and outstanding authorities in the Graphic Arts as well as in marketing circles. Samuel A. Gifford, secretary-treasurer of the company, who directs the sales forum put it: "It gives our men an opportunity to obtain first hand information on new trends and opinions on future developments. It also gives the men who represent Milton a chance to exchange their ideas with leaders in the industry."

FINANCIAL RECORD OF THE WEEK

New York Stock Exchange

High, Low and Last for Week Ending September 20, 1947

STOCKS

	High	Low	Last
A. P. W.	....	....	....
Armstrong Cork Co.	48¾	46⅞	48⅜
Armstrong Cork Co., pf.	107½	107⅛	107⅛
Celotex Corp.	29½	27½	28⅞
Celotex Corp., pf.	20⅜	20⅜	20⅜
Certain-Teed Products Corp.	17⅝	16	17¼
Certain-Teed Products Corp., pf.	....	....	....
Champion Paper & Fibre Co.	23⅞	22¾	23¼
Champion Paper & Fibre Co., pf.	108	108	108
Congoleum Nairn Co.	29¾	29⅛	29⅛
Container Corp. of America	41⅞	39½	41
Container Corp. of America, pf. 4	103	102	103
Crown Zellerbach Co.	31½	30¾	31¼
Crown Zellerbach Co., pf. 4.20	106	105⅛	106
Crown Zellerbach Co., 4 pf. 4	118½	117¼	118½
Dixie Cup Co.	40½	39½	39½
Dixie Cup Co., A	52	51⅛	52
Flintkote Co.	36¼	34¼	35½
Flintkote Co., pf.	107¾	107¾	107¾
Robert Gair	9¼	8¾	9⅛
Robert Gair, pf.	19⅞	19¾	19⅞
International Paper Co., pf.	107	106¼	106¼
International Paper Co.	50⅞	47⅞	50⅞
Johns-Manville Corp.	43⅜	39¾	43⅜
Johns-Manville Corp., pf.	118	118	118
Kimberly-Clark Corp.	24	22⅞	23½
Kimberly-Clark Corp., pf.	110	109½	109½
MacAndrews & Forbes	37¼	36½	36½
Mac Andrews & Forbes, pf.	....	....	....
Marathon Corp.	23½	22¾	23½
Mead Corp.	21⅜	20	21
Mead Corp., pf. 4¼	94½	94½	94½
Mead Corp., pf. 2	46¾	46	46¾
National Container Corp.	14	13⅝	13¾
Paraffine Companies, Inc.	107	107	107
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	28¼	25⅞	27⅝
Rayonier, Inc., pf.	37¾	36⅝	37⅜
Ruberoid Co.	61½	56	60
St. Regis Paper Co.	10½	9⅝	10½
St. Regis Paper Co., pf.	94	93	93
Scott Paper Co.	47	46¾	46¾
Scott Paper Co., pf.	102½	102½	102½
Sutherland Paper Co.	40	40	40
Union Bag & Paper Corp.	34½	32½	33½
United Paperboard Co.	16¼	15⅛	15⅜
U. S. Gypsum Co.	101	99½	100½
U. S. Gypsum Co., pf.	190	188	190
West Virginia Pulp & Paper Co.	43	40	42½
West Virginia Pulp & Paper Co., pf.	....	....	....

BONDS

Celotex Corp., 3¾s '60	103¾	103¾	103¾
Certain-Teed Products Corp., 5½s '53	....	....	....
Champion Paper & Fibre Co., 3s '65	....	....	....
Mead Corp., 3s '68	....	....	....

New York Curb Exchange

High, Low and Last for Week Ending September 20, 1947

STOCKS

	High	Low	Last
Great Northern Paper Co.	45½	45	45
Taggart Corp.	10	10	10

BONDS

American Writing Paper Co., 6s '61	....	....	....

A DYNAMIC ONE-OUNCE ANSWER TO PAPER MILL SLIME

A one-ounce packet of PYRIDOSE—thrown unopened into your beaters or refiners—is deadly to common slime-forming organisms.

PYRIDOSE is dynamic and economical in controlling paper mill slime. It gets to work immediately – since its active ingredient is 140 times more soluble than other comparable agents.

When you use the handy one-ounce packet of PYRIDOSE there is no need to stop machines . . . no waste of materials.

For further details write to your nearest MALLINCKRODT office.

FINE CHEMICALS Mallinckrodt SINCE 1867

MALLINCKRODT CHEMICAL WORKS

80 Years of Service *to Chemical Users*

Mallinckrodt St., St. Louis 7, Mo. • 72 Gold St., New York 8, N. Y.

CHICAGO • PHILADELPHIA • LOS ANGELES • MONTREAL

UNIFORM • DEPENDABLE • PURITY

Western Sapeyes End Tournament Season

CHICAGO—The western division of the Salesmens Association of the Paper Industry brought to a close its summer golf outings on Tuesday, September 16, when seven foursomes toured the Olympia Fields Golf Club course and eight additional members and guests turned out for the informal dinner afterward. Shooting an 87 on the extremely tough course, Ed Rolain won possession of the George Gibson trophy for one year, having won the low gross two times during the 1947 season. His closest competitor was Sterling Brown.

Low gross for the day was won by a guest, William Taylor of the Milcraft Company of Fort Wayne. High gross honors were captured by Ed Walsh of the Mead Sales Company. His score was withheld by Len Ransom of the Union Bag Company, chairman of the golf committee.

Mr. Ransom is now busy tabulating returns on the questionnaire he sent out to determine how many outings the golfers wanted in 1948, the day of the week which would be most popular and the type of course. Thus far, he reports, those who want three and four outings a summer are in a virtual tie. The day of the week is "scattered all over the place," according to Mr. Ransom. As for the preference for public courses and private courses, the former seem to dominate, preferring the lower cost to the price tag put on the outing by the excellent private courses. Returns will be completed shortly and the tabulations announced possibly at the time Ed Romlain formally receives his trophy.

Meanwhile, the SAPEYES are continuing closed sessions on their Monday meeting days at the Sherman but have announced that a special luncheon will be held during the October meetings of the National Paper Trade Association in Chicago. Both Eastern and Western members will be permitted to invite guests through a system of reservations to be announced later. All SAPI officers are expected to be present at this informal regular meeting which will bring both Eastern and Western divisions togethere.

Sutherland Mill Visit Brings Trophy to Grand Rapids Club

KALAMAZOO—An international trophy awarded in recognition of the designing and printing of the best poster promoting the observance of Benjamin Franklin week, was presented last week to the Grand Rapids Craftsmen Club members at the Columbia Hotel, Kalamazoo, where they were guests of the Sutherland Paper Company at a buffet dinner.

The ninety club members had journeyed from Grand Rapids to Kalamazoo to visit the Sutherland Paper mill where they toured the standard carton division, board division and specialty division. Ten guides took them through the mill under the direction of Clifton Wilson who arranged the event.

Following the tour they were entertained at the buffet dinner and a short business meeting was held. The club is composed entirely of members of the graphic arts field: engravers, photographers, paper jobbers and printers. One of the members had done the work which received the honor in international competition.

St. Joseph's Expands Its Paper Course

PHILADELPHIA, Pa.—Saint Joseph's College, 54th street and City Line avenue, will open its evening school of paper making on Monday, October 13th. It is scheduled to close on Friday, May 28th, 1948.

Rev. Joseph J. Molloy, S. J., who is in charge, states that judging from the number of requests for admission to this year's sessions, they feel it might be necesary to restrict admission.

The course will include paper calculations; technical English; paper machines; fundamental chemistry; applied methods of analysis; sizing; coating; printing processes and printing inks; organic chemistry; colloid chemistry and the chemistry of pulp and paper making.

This year the faculty will be increased by the addition of Messrs. Fronmuller, Britt and Marsh of Scott Paper Comanpy; Mr. Leishman of Dill and Collins, and James Friel of Container Corporation of America.

Stein Hall Names Kline Manager at Charlotte

NEW YORK CITY — Stein, Hall & Company, Inc., importers and manufacturers of industrial raw materials, have named William N. Kline, Jr., as manager of the company's branch office in Charlotte, N. C. Mr. Kline, a graduate of Clemson College, S. C., calss of 1929, has been associated with the company since June 1929. At that time he joined the Charlotte branch office as a chemist. In 1930, he was transferred to the sales staff of the same office and was appointed assistant manager thereof in the spring of 1943. Since June 1, 1947, Mr. Kline has been directing the Charlotte office as acting manager.

Marathon Housewarming Opens Carton Plant

MENASHA, Wis. — A housewarming party for Marathon Corporation's employes was held Saturday evening, September 20, in the recently completed carton manufacturing plant. Officials also are planning an open house for townspeople and others interested, to enable them to tour the plant.

Waste Dealers Plan For Busy Convention

Advance registration covering the Fall Convention of the National Association of Waste Material Dealers, Inc., to be held at the Ritz-Carlton Hotel, Atlantic City, from October 4th to October 6th, has been extremely heavy.

Many delegates are planning to arrive as early as Friday, October 3rd and the first social feature will be a cocktail party and dinner-dance on Saturday evening, October 4th. Some fine entertainment will be provided.

Other social features consist of a large members luncheon on Monday, October 6th, also a very attractive luncheon for ladies, which luncheon will be served in the Ritz Tavern on the same day. A feature of the Laies' Luncheon will be a Fashion Show by Gettleman's Furs, Inc. Already over 200 ladies have made advance registration for the Convention.

Outside of committee meetings and various conferences, the business sessions will be limited to Monday, October 6th. The Board of Directors will hold a Breakfast Meeting at 9 A. M. This will be followed by a joint meeting of the Waste Paper Institute and the Cotton Rag Council. Following the Members Luncheon on the same day, there will be a meeting of the Association with all Divisions represented, which meeting will be followed by a joint meeting of the Seconday Metal Institute and the Metal Dealers Division.

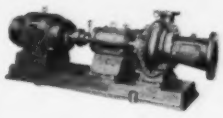
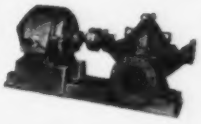
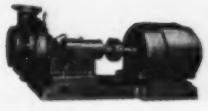
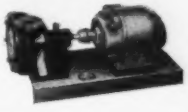
Abitibi Challenges Subpoena Of United States Jury

NEW YORK—Abitibi Power & Paper Company on Monday challenged the right of a Federal grand jury to subpoena books and records of the company in an investigation of the newsprint industry on ground that it did no business in the United States. John A. Wilson, testifying in United States District Court, argued that the subpoena, served May 7 on Harry C. Conway, vice-president of G. H. Mead Company, at Dayton, Ohio, was invalid because it was not served properly on the Abitibi company.

Walter K. Bennett, special assistant United States attorney general, declared that 90 percent of the checks drawn on the New York bank account of Abitibi were payable to payees in the United States, and that the operations of both companies were involved. Judge Stephen W. Brennan reserved decision and gave both parties until October 7 to file briefs.

Let's Take Up YOUR Pumping Problems

Worthington Solves Them with the Specific Pump for Every Paper Processing Job

Questions	Answers	
What's the best stock pump for sulphate, sulphite, soda, ground wood, waste paper, cotton linters, etc.?		An FP pump will handle them at capacities up to 6,000 gpm, heads to 200 ft. and consistencies to 7%.
How about a good white water or fan pump?		Use L and LA pumps for all heads and capacities with consistencies up to 1%.
What's a reliable pump for green or white liquor?		A CG Worthite is the ideal pump for dissolving-tanks, transfer and causticizing.
Handling black liquor is always a big problem at our mill. What pumps are best for its various phases?		For furnace feed of black liquor with suspended cake there's nothing like a CH pump.
		For circulation and transfer of concentrated black liquor at viscosities up to 10,000 ssu, use a CL.
		Black liquor pumping for multiple effect evaporators is best handled with a CG Worthite pump.

The Worthington Centrifugal Pumps shown here are your best answers for the general run of paper processing needs. Acids, bleaches, alum, sizes and other abrasive, corrosive, viscous or volatile liquids are handled efficiently and economically by these and other pumps in the world's most complete line.

Is Your Problem Different?

But perhaps you've met with some entirely new difficulty — either in processing or such general mill service as boiler feed, condensate or fire protection.

Whatever it may be, take advantage of the longest, most comprehensive experience in the field. Call our nearest district office or write to us direct. You'll get the prompt, expert cooperation on any pumping problem — no matter how unusual or complicated — that proves *there's more worth in Worthington.*

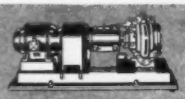
Worthington Pump and Machinery Corporation, Centrifugal Pump Division, Harrison, N. J.

MEMBER

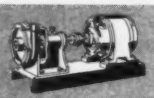
WORTHINGTON

C7-3

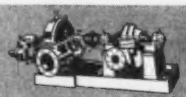
THE WORLD'S LARGEST MANUFACTURER OF PUMPS



CENTRIFUGAL STOCK PUMPS Type FP. Handle all kinds of stock up to 7% consistency. 4 sizes. Capacities up to 6000 GPM; heads up to 200 ft.; speeds up to 1750 RPM.



GENERAL PURPOSE PUMPS Type CF. Open impeller. Single stage. Sizes 1" to 4". Capacities up to 1000 GPM; heads up to 130 ft.; speeds up to 2475 RPM.



BOILER FEED PUMPS Type UB-2. 7 sizes. Capacities up to 1500 GPM; heads up to 1000 ft.; speeds up to 3600 RPM.

Congress Awards Contracts For Fourth Quarter's Paper

WASHINGTON — Awards were announced today by the Joint Congressional Committee on Printing for paper for use of the Government Printing Office for the three months period beginning October 1, 1947. Bids for the paper were received on September 15.

The awards follow, as they were made public. The items on which no bids were received, or no awards made, have been eliminated from the list as it was published last week.

No. 3. Barton, Duer & Koch Paper Co., 11.73 cents. No. 4. Barton, Duer & Koch Paper Co., 11.73 cents. (300,000 pounds.)

No. 6. Mead Sales Co., 10.72 cents.

No. 7. Mead Sales Co., 10.72 cents.

No. 8. Mead Sales Co., 10.72 cents.

No. 10. Paper Corporation of America, 16.25 cents.

No. 19. Paper Corporation of United States, 15.75 cents (200,000 pounds); Central Ohio Paper Co., 13.25 cents (150,000 pounds).

No. 20. Whitaker Paper Co., 10.57 cents (300,000 pounds); Paper Corporation of United States, 14.75 cents (300,000 pounds); Paper Corporation of America, 16.00 cents (1,700,000 pounds); Mudge Paper Co., 11.49 cents (200,000 pounds).

No. 22. Mead Sales Co., 10.77 cents.

No. 23. Walker-Goulard Plehn Co., 21.00 cents (rejected).

No. 27. Paper Corporation of United States, 19.80 cents.

No. 29. Paper Corporation of United States, 18.65 cents.

No. 34. R. P. Andrews Paper Co., 8.58 cents.

No. 37. Barton, Duer & Koch Paper Co., 11.61 cents.

No. 38. Barton, Duer & Koch Paper Co., 10.80 cents.

No. 40. Consolidated Water Power & Paper Co., 10.739 cents.

No. 45. R. P. Andrews Paper Co., 9.21 cents.

No. 46. Paper Corporation of America, 16.75 cents.

No. 47. Old Dominion Paper Co., 15.47 cents; Old Dominion Paper Co., 16.23 cents.

No. 48. Paper Corporation of America, 16.00 cents.

No. 50. R. P. Andrews Paper Co., 19.27 cents (150,000 pounds); D. L. Ward Co., 18.81 cents (200,000 pounds).

No. 53. Paper Corporation of America, 16.50 cents (200,000 pounds); R. P. Andrews Paper Co., 10.09 cents (800,000 pounds); Stanford Paper Co., 12.05 cents (250,000 pounds); D. L. Ward Co., 14.01 cents (750,000 pounds).

No. 54. Paper Corporation of America, 16.00 cents.

No. 55. R. P. Andrews Paper Co., 9.07 cents.

No. 56. R. P. Andrews Paper Co., 8.48 cents.

No. 58. Paper Corporation of America, 17.25 cents; Paper Corporation of America, 16.75 cents.

No. 59. Paper Corporation of America, 16.25 cents.

No. 61. Barton, Duer & Koch Paper Co., 13.15 cents.

No. 64. Paper Corporation of United States, 20.70 cents.

No. 69. Barton, Duer & Koch Paper Co., 22.80 cents.

No. 72. Frank Parsons Paper Co., 17.22 cents.

No. 74. Frank Parsons Paper Co., 18.58 cents.

No. 75. Barton, Duer & Koch Paper Co., 34.85 cents.

No. 76. R. P. Andrews Paper Co., 29.00 cents.

No. 102. Paper Corporation of America, 16.00 cents.

No. 103. Paper Corporation of America, 17.25 cents.

No. 104. Paper Corporation of America, 16.00 cents.

No. 105. Howard Paper Mills, Aetna Paper Co. Division, 22.73 cents.

No. 106. Howard Paper Mills, Aetna Paper Co. Division, 18.46 cents.

No. 107. Howard Paper Mills, Aetna Paper Co. Division, 18.46 cents.

No. 108. Howard Paper Mills, Aetna Paper Co. Division, 18.46 cents.

No. 109. Howard Paper Mills, Aetna Paper Co. Division, 17.48 cents.

No. 113. Howard Paper Mills, Aetna Paper Co. Division, 19.19 cents.

No. 114. Howard Paper Mills, Aetna Paper Co. Division, 18.27 cents.

No. 128. Barton, Duer & Koch Paper Co., 31.85 cents.

No. 150. Paper Corporation of America, 15.00 cents.

No. 151. Paper Corporation of America, 15.00 cents.

No. 153. Paper Corporation of America, 15.00 cents.

No. 154. Howard Paper Mills, Aetna Paper Co. Division, 18.72 cents.

No. 156. Collins Manufacturing Co., 18.99 cents.

No. 157. Collins Manufacturing Co., 19.65 cents.

No. 176. Barton, Duer & Koch Paper Co., 32.85 cents.

No. 177. Barton, Duer & Koch Paper Co., 32.85 cents.

No. 183. Walker-Goulard Plehn Co., 14.50 cents.

No. 189. Howard Paper Mills, Aetna Paper Co. Division, 18.93 cents.

No. 191. Barton, Duer & Koch Paper Co., 19.82 cents.

No. 196. Barton, Duer & Koch Paper Co., 32.85 cents.

No. 202. R. P. Andrews Paper Co., 11.72 cents.

No. 203. Whitaker Paper Co., 11.68 cents.

No. 206. R. P. Andrews Paper Co., 19.68 cents.

No. 252. Stanford Paper Co., $20.60 per M sheets.

No. 271. Paper Corporation of United States, 13.11 cents.

No. 280. R. P. Andrews Paper Co., 14.55 cents.

No. 303. Stanford Paper Co., $95.84 per M sheets.

No. 310. R. P. Andrews Paper Co., 14.02 cents.

No. 325. Whitaker Paper Co., 7.97 cents (2,250,000 pounds); R. P. Andrews Paper Co., 7.55 cents (2,000,000 pounds).

No. 326. Whitaker Paper Co., 7.97 cents (2,250,000 pounds); R. P. Andrews Paper Co., 7.55 cents (2,000,000 pounds).

No. 327. Whitaker Paper Co., 7.97 cents (2,250,00 pounds); R. P. Andrews Paper Co., 7.55 cents (2,000,000 pounds).

No. 360. Paper Corporation of United States, 5.18 cents.

No. 368. Consolidated Paper Co., 3.24 cents.

No. 369. Mead Sales Co., 5.60 cents.

No. 370. Mead Sales Co., 5.60 cents.

Machine Tool Show Opens in Chicago

CHICAGO — Of considerable interest to portions of the paper industry is the 1947 machine tool show which opens in Chicago September 17 and continues on through September 26. About four to five thousand machine tool industrial and business executives are expected to be on hand for meetings of the National Tool Builders Association and for the tremendous display of tools. Theme of the meeting and exhibit will be to show manufacturers how they can reduce costs with new and improved machines. Quantities of new products are expected and the demand is said to be coming from manufacturers who wish to keep their plants competitive and to maintain full consumer purchasing power.

Many of the machines on display at the Dodge plant area where the exhibits are held are improved designs that increase the speed of operation, make it possible to cut metal more quickly and cheaply and which have developed the "automatic" angle so prized by time students. The display is spread throughout more than 500,000 square feet of floor space with a vast array of machine tools representing virtually every type of metal working equipment. Many of the tools on display were in actual operation and sections of the exhibition resembled large machine shops. Attendance at the exhibits and during the formal Association program is expected to reach more than 100,000 total.

INTERESTING FACTS ABOUT PAPER

Paper, deriving its name from papyrus, the Egyptian water plant, was first developed by the Chinese about 105 A.D. They made it from mulberry bark, bamboo and old fish nets, and they kept their process secret from the rest of the world for several hundred years.

INTERESTING FACTS ABOUT DIRECT CHINOLINE

DIRECT CHINOLINE is the brightest and greenest direct yellow. Possessing excellent solubility, level dyeing and good light fastness, it is recommended for use in coloring bond, book and cover papers to produce bright yellows or greens in combination with QUINIZOL BLUE BP CONC. DUSTLESS.

Your Heller & Merz representative will gladly supply full information about DIRECT CHINOLINE and acquaint you with our wide range of colors for papers.

CALCO CHEMICAL DIVISION
Heller & Merz Department

Calco — Heller & Merz Department

AMERICAN CYANAMID COMPANY
Bound Brook, New Jersey

New York • Chicago • Boston • Philadelphia • Charlotte • Providence

Apprentice School Begins Second Year

HUDSON FALLS, N. Y.—The second year of the Apprenticeship Training School conducted in the Hudson Falls Industrial Arts Building began on Saturday morning, Sept. 6. Approximately 50 veterans have enrolled for training in this year's school.

The Apprenticeship Training School abides by standards set up and approved by the New York State Apprenticeship Council and the New York State Department of Labor and Education in cooperation with the Federal Committee on Apprenticeship.

Special significance was lent to the school opening on Saturday when Eugene R. Bernard was awarded his journeyman's diploma as a machinist after completion of his four years of apprenticeship and his meeting of the standards set up by the Apprenticeship Council.

Donald R. Cummings, apprenticeship training representative of the New York State Apprenticeship Council in Albany, was present to award the journeyman's diploma to Mr. Bernard.

In addition to serving his time in apprenticeship, a person seeking a journeyman's diploma must attend an approved school for not less than 144 hours a year and meet other basic requirements.

The Hudson Falls Apprenticeship Training School was inaugurated at the request of the Sandy Hill Iron and Brass Works management. They wished to provide their veteran employes with an opportunity to take advantage of their G. I. training rights.

The school is not confined to veterans although only veteran receive benefits in the form of subsistence allowance and book and tool allowances. The school is not confined to employes of the Sandy Hill Iron and Brass Works.

The following classes receive instruction each Saturday morning from 8 to 12 during the regular school year:

Trade science and theory and metallurgy and chemistry of materials taught by J. Bernard Labourr; elementary and advanced blueprint readings, taught by John Fontaine; industrial history, taught by Joseph Teti; related trade mathematics taught by Edward A. Reynolds; drafting and shop sketching and courses in shop safety taught by Cecil E. West. Mr. West is supervisor of the school. Dana M. King, superintendent of schools at Hudson Falls, has given the school every assistance in its organization.

Sixteen first year classmen who enrolled at the Institute of Paper Chemistry on August 20th have returned to Appleton following a three and a half week's course in wood technology at the Trees for Tomorrow Conservation Camp at Eagle River. Future Chemists and research men combined field trips with laboratory work in the study of dendrology, observation on wood structure, and effect on properties of wood.

Conducted tours were made to the Nicolet National Forest, Consolidated Water Power and Paper Industrial Forest, Star Lake Plantation, the Hugo Sauer Nursery, the Goodman Lumber Company, the Rhinelander Paper Company, the Consolidated Water Power and Paper Company, and the Nekoosa Edwards Paper Company.

Right Dr. I. S. Isenberg, Institute of Paper Chemistry, shows first year classmen how to identify Norway pine on a field trip. Extreme left, Dr. J. E. Todd, Assistant Dean, and Dr. S. D. Wells of the Institute staff.

New Jones Machine Is Named Pulpmaster

PITTSFIELD, Mass.—After satisfactory mill performance of a new pulping machine, mill men were invited by E. D. Jones & Sons Company, to suggest a name for this pulper. The contest closed July 15, 1947, and after six weeks' deliberation, the contest committee selected the name: Jones Pulp-Master. This name was submitted by Joe E. Stevens, employed by the Northwest Paper Company, Cloquet, Minn., a tour foreman in the sulphite department. He was given a five-hundred dollar cash award for suggesting the name.

Mr. Stevens is 36 years old and had attended high school and Northwestern Preparatory Academy before starting employment in 1929 with the Northwest Paper Company. After various jobs he became sulphite cook, and in 1941 was promoted to tour foreman. His family comprises Mrs. Stevens and four children (two boys and two girls) who all joined in the excitement of his having won the contest award.

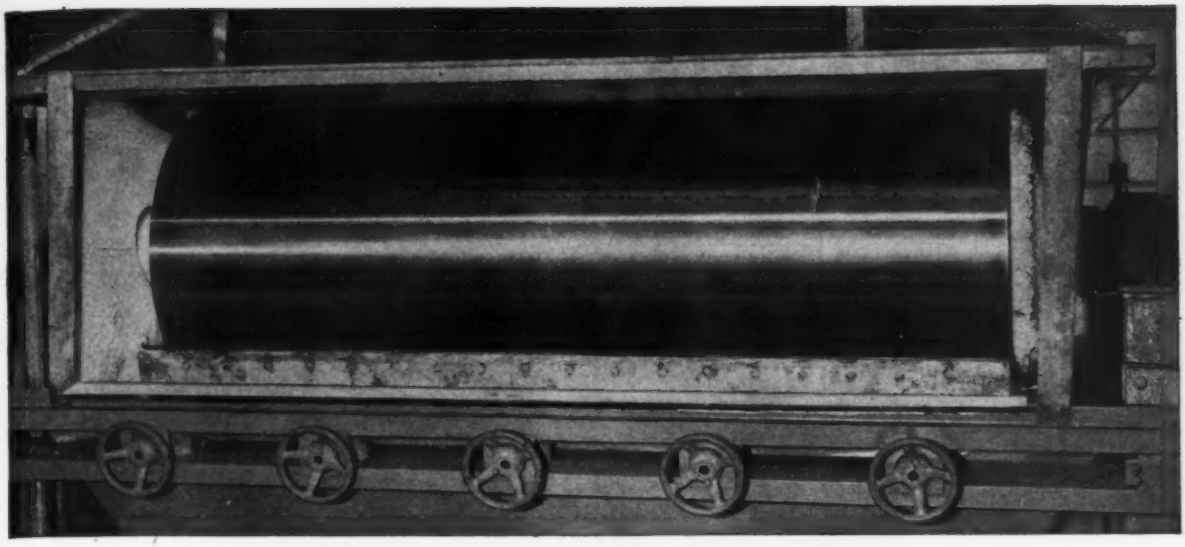
The Jones Pulp-Master takes a one-ton charge in full bales of pulp or wastepapers and thoroughly disintegrates the material for subsequent refining processes at consistencies ranging from 3 percent to 8 percent in ten minutes for pulp, or 30 to 40 minutes for wastepapers. Wet strength papers take slightly longer periods.

New Zealand Begins Newsprint Experiment

OTTAWA, Ont. — Reports arriving here indicate that New Zealand is experimenting in making newsprint from locally grown pinus insignis. Because of the impossibility of obtaining sufficient supplies of newsprint from Canada, newspapers in the Dominion are rationed to between 10 and 14 pages daily and augmenting supplies from local sources would be of great assistance to the industry.

Although lower grades of paper and cardboard are already produced in New Zealand there is no mill capable of producing newsprint so a shipment of pinus insignis was sent to mills in Tasmania. The paper product has some specks in it owing to shortage of dye. However, quality of the paper appears good and capable of being improved by treatment into high-grade newsprint.

New Zealand has large forests of pinus insignis and other pines planted by afforestation companies. They grow very quickly and several of the forests now are reaching maturity.



PRODUCTION UP 25%
with Lukenweld Jacketed Drier Rolls

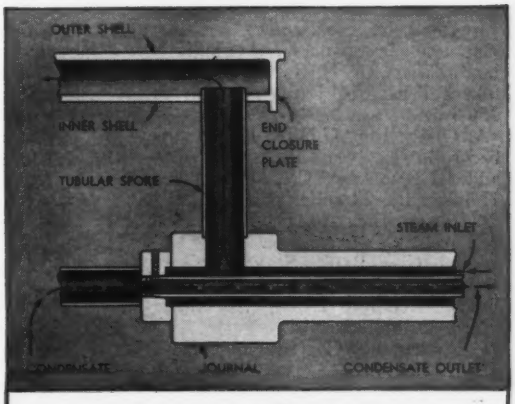
(PATENTS APPLIED FOR)

Production went up 25 per cent when Lukenweld *Jacketed* Drier Rolls replaced drum-type cast rolls in the machine shown above.

No other changes were made—increased production was entirely due to the greater drying efficiency and positive method of condensate removal provided by Lukenweld design and welded steel plate construction. Records, since installation of these rolls nine years ago, show that steam consumption was substantially reduced.

Whether planning new machines or looking for ways to increase production from your present equipment, you can make important savings with Lukenweld Jacketed Drier Rolls. With no increase in steam pressure, users report drying efficiency increased by 15 to 25 per cent. At higher steam pressures—up to 350 psi. with safety—efficiency increases are much greater. Welded steel construction permits a design that meets and maintains exacting dimensional tolerances.

The complete story about Lukenweld Jacketed Drier Rolls is contained in Bulletin 358. For your copy, write Lukenweld, Inc., 403 Lukens Building, Coatesville, Pa.



Lukenweld jacketed design effects superior heat transfer by keeping steam in constant circulation against the roll face, while removing condensate as rapidly as it forms. The rolls used in the machine illustrated above are 11′ 3⅜″ over-all by 2′ 8″ O. D. with a 7′ 6″ face.
Sizes from 2 feet to 18 feet O.D. and over.

Sizes from 2 feet to 18 feet O. D. and over

LUKENS
LUKENWELD DIVISION

LUKENWELD, Inc.
DRIER ROLLS AND DRYING MACHINERY

IMPORTS

NEW YORK IMPORTS

WEEK ENDING SEPT. 20, 1947

SUMMARY

Newsprint	15,950 rolls
Printing Paper	20 cs., 291 rolls
Wrapping Paper	306 rolls
Tracing Cloth	24 cs.
Kraft Paper	210 rolls
Paperhangings	6 bls., 2 cs.
Serviettes	2 cs., 15 bls.
Gummed Paper	47 cs.
Tissue Paper	1 bl., 22 cs.
Boxboard	73 rolls
Carbon Paper	4 cs.
Writing Paper	1 cs.
Filter Paper	27 cs.
Drawing Paper	3 cs.
Photo Paper	68 cs.
Imitation Leather Paper	1 cs.
Miscellaneous Paper	228 rolls, 29 cs.

NEWSPRINT

N. Y. Journal American, Markland, Liverpool, N. S., 1068 rolls.
N. Y. Herald Tribune, Markland, Liverpool, N. S., 1718 rolls.
N. Y. World Telegram, Markland, Liverpool, N. S., 662 rolls.
Herald Statesman, Inc., Markland, Liverpool, N. S., 42 rolls.
Richmond Newspapers, Inc., Markland, Liverpool, N. S., 1729 rolls.
Bankers Trust Co., Paraguay, Gdynia, 356 rolls.
R. A. Olsen, Inc., G.D.D., Donnacona, 375 rolls.
Madden Reeve Angel Co., Mormacpine, Helsingfors, 23 rolls.
R. A. Olsen, Inc., A.C.D., Donnacona, 368 rolls.
National City Bank, Stavangerfjord, Oslo, 283 rolls.
Newark Evening News, Stavangerfjord, Oslo, 185 rolls.
D. C. Andrews & Co., Stavangerfjord, Oslo, 125 rolls.
Bankers Trust Co., Falstria, Gdynia, 278 rolls.
H. G. Craig Co., Donpaco, Donnacona, 352 rolls.
News Syndicate Co., International No. 1, Gatineau, 304 rolls.
Stora Kopparberg Corp., Malcolm M. Stewart, Gefle, 686 rolls.
News Syndicate Co., Colabee, Baie Comeau, 7396 rolls.

PRINTING PAPER

Oxford University Press, American Scout, Manchester, 17 cs.
Madden Reeve Angel Co., Mormacpine, Helsingfors, 291 rolls.
S. H. Pomerance, American Farmer, London, 3 cs.

TRACING CLOTH

Keuffel & Esser Co., American Scout, Manchester, 24 cs.

WRAPPING PAPER

Bank of The Manhattan Co., Mormacpine, Gothenburg, 105 rolls.
Manufacturers Trust Co., Drottningholm, Gotherburg, 33 rolls.
National City Bank, Drottningholm, Gothenburg, 105 rolls.
Joe Salwen Paper Products Corp., Malcolm M. Stewart, Gefle, 161 rolls.
Leroy Segall Co., Malcolm M. Stewart, Gefle, 102 rolls.

KRAFT PAPER

Interstate Cordage & Paper Co., Drottningholm, Gothenburg, 210 rolls.

PAPERHANGINGS

W. H. S. Lloyd & Co., American Farmer, London, 6 bls., 2 cs.

SERVIETTES (PAPER)

(———), Fort Musquarro, London, 15 bls.
(———), Vasconia, Liverpool, 2 cs. (crepe).

GUMMED PAPER

B. F. Drakenfeld & Co., Vasconia, Liverpool, 47 cs. (not printed).

TISSUE PAPER

Globe Shipping Co., Paraguay, Copenhagen, 1 bl.
B. F. Drakenfeld & Co., American Scout, Manchester, 22 cs. (pottery).

BOXBOARD

Jay Madden Corp., Mormacpine, Gdynia, 73 rolls.

CARBON PAPER

S. Rahmas, Drottningholm, Gothenburg, 4 cs.

WRITING PAPER

Gerhard & Hey, Mormacpine, Gothenburg, 1 cs.

FILTER PAPER

H. Reeve Angel & Co., Inc., American Farmer, London, 23 cs.
E. H. Sargent & Co., Drottningholm, Gothenburg, 4 cs.

DRAWING PAPER

H. Reeve Angel & Co., Inc., American Farmer, London, 3 cs.

PHOTO PAPER

American Express Co., American Farmer, London, 46 cs. (base).
Lep Transport, Inc., American Farmer, London, 10 cs.
(———), American Farmer, London, 8 cs.
J. J. Gavin Co., Queen Elizabeth, Southampton, 4 cs.

IMITATION LEATHER PAPER

(———), Tahsinia, Glasgow, 1 cs.

MISCELLANEOUS PAPER

Curacao Trading Co., Drottningholm, Gothenburg, 2 cs.
Resolute Paper Products Corp., Drottningholm, Gothenburg, 136 rolls.
Chase National Bank, Drottningholm, Gothenburg, 92 rolls.
D. C. Andrews & Co., Queen Elizabeth, Southampton, 1 cs.
F. P. Gaskell & Co., Tahsinia, Glasgow, 26 cs.

RAGS, BAGGINGS, ETC.

Irving Trust Co., Alwaki, Antwerp, 145 bls. old bagging.
(———), Newberry Victory, Alexandria, 162 bls. old bagging.
J. Eisenberg, Maarinero, Buenos Aires, 27 bls. white thread rags.
A. W. Fenton Co., Star of Alexandria, Alexandria, 81 bls. cotton rags.
Continental Bank Trust Co., Pacific Victory, Trieste, 71 bls. old light cotton rags.
1st National Bank Chicago, General Bagration, Leningrad, 170 bls. cotton bagging; 1783 bls. cotton waste.
1st National Bank Boston, Kamenetz Podolsk, Leningrad, 6036 bls. cotton linters.
Amtorg Trading Corp., Kamenetz Podolsk, Leningrad, 870 bls. cotton waste.
(———), Coastal Delegate, Vera Cruz, 38 bls. wool rags.

OLD ROPE

E. J. Keller Co., Inc., Pacific Victory, Trieste, 103 bls.

CASEIN

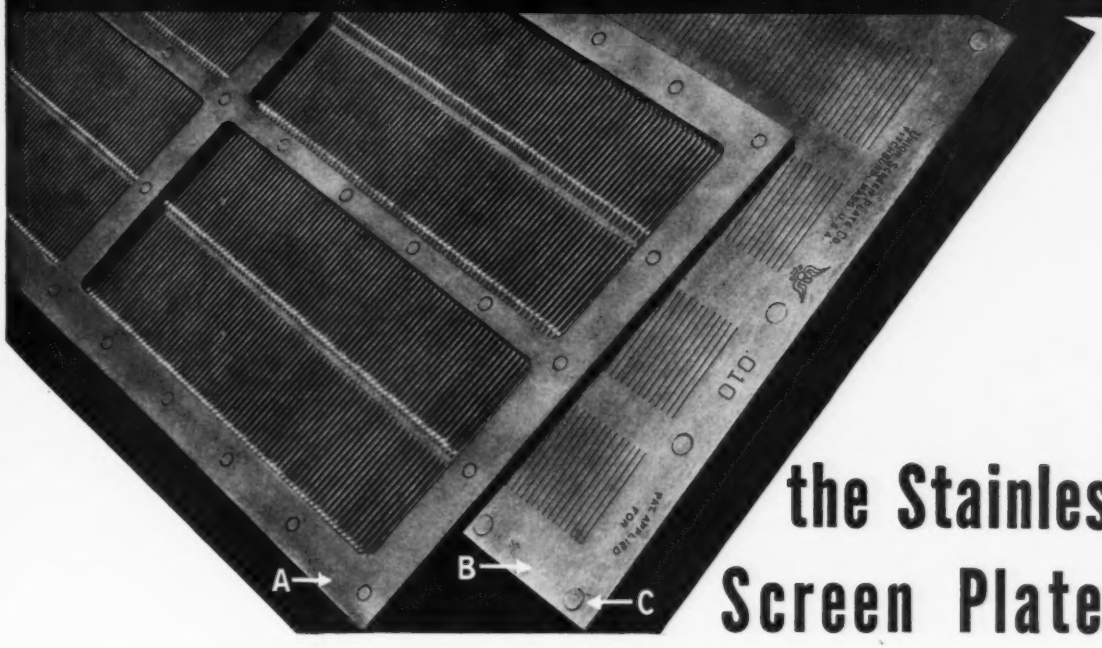
Paul A. Dunkel, Campero, Buenos Aires, 834 bags.
Casein Co. of America, Div. of The Borden Co., Marinero, Buenos Aires, 1000 bags (ground lactic).
R. F. Downing & Co., American Farmer, London, 56 drums.
American Cyanamid & Chemical Corp., Trinidad, Buenos Aires, 500 bags (ground lactic).

WOODPULP

The Borregaard Co., Inc., Stavangerfjord, Oslo, 200 lbs. dry sulphite pulp.
Cellulose Sales Co., Malcolm M. Stewart, Stugsund, 1175 bls. sir dry sulphite pulp.
Bulkley Dunton Pulp Co., Malcolm M. Stewart, Gefle, 635 bls. dry sulphite pulp.
Pulp & Paper Trading Co., Malcolm M. Stewart, Hernosand, 1218 bls. 2nd quality strong sulphite pulp.
Perkins Goodwin & Co., Malcolm M. Stewart, Hernosand, 1524 bls. 2nd quality strong sulphite pulp.
Cellulose Sales Co., Malcolm M. Stewart, Hernosand, 2100 bls. sulphite pulp.
Cellulose Sales Co., Malcolm M. Stewart, Sundsvall, 900 bls. dry sulphite pulp.

(Continued on page 48)

* CORROSIST



the Stainless Screen Plate •

Here is the Screen Plate you have been waiting for. Rugged enough to withstand normal use without breakage. No rebuilding of your present screens. No "babying" to get full capacity. Standard dimensions. Unlimited life. Made entirely of stainless, corrosion-resisting metals. Proven by 8 years of service in Canadian Pulp and Paper Mills.

CONSTRUCTION: (See photo)

A. FRAME—Butt-welded Monel bars form an amazingly stiff back-bone, reduce flexing.

B. PLATE—1/8" Stainless steel, milled and sawed. Slot "breathing" held to the minimum.

C. RIVETS—Inconel for toughness, set home under 5 tons pressure per rivet.

STANDARDS:

CUT: 4, 5, 6 and 8 slots per inch.

SLOT: Cut .008" and larger.

STYLE: C and E only.

LENGTH: 43" and 42".

THICKNESS: 3/8" only.

WIDTH: 12" drilled and 10 3/4" Witham beveled.

* Trade Mark

UNION SCREEN PLATE COMPANY
FITCHBURG, MASSACHUSETTS

TRENDS

Office of the PAPER TRADE JOURNAL,
Wednesday, September 24, 1947.

Over-all domestic requirements for paper and paperboard should be met and inventories replenished in the course of a few months. Newsprint, kraft wrapping, grocery bags, lightweight papers are all still cited by numerous consumers as examples of items which are still tight. While paper towels, napkins, and certain other items are reported in easier supply. Paper and paperboard demand continues strong; but resistance to mounting prices is still apparent. The resistance to higher prices which became apparent during the past few months has relaxed somewhat and some buyers who canceled their allotments in June are now trying unsuccessfully to obtain the paper. •However, resistance to substitution continues and buyers refuse to accept paper of a higher grade than that ordered. . . . Supplies of fine papers continue tight, although the Middle West reports a slight easing in the situation insofar as sulphite bonds are concerned. A confused supply situation continues owing to the fact that some consumers are substituting other types of paper when those they normally used are unobtainable. The supply of converted toilet tissue is still short. Paper towels and napkins are available in larger quantities and the tissue situation generally has eased somewhat. Some reports indicate that, because of the resistance to high prices on tissue, it moves slowly at moderate mark-ups. Demand for most grades of paperboard continues strong although reports indicate there is some easing in requirements for folding boxboard. Paperboard mills, however, have large enough backlogs to keep them operating at high levels for some time to come. In general, paper and board supplies are on the increase, but it will be several months yet before all demands are met and inventories satisfactorily replenished.

The index of general business activity for the week ended September 13 rose to 141.7 from 140.8 for the preceding week, compared with 134.5 for the corresponding week of 1946. The index of paperboard production rose to 171.3 from 162.7 in the preceding week, compared with 158.5 for the corresponding week of 1946.

Paper production for the week ended September 13 was estimated at 107.8 percent, compared with 84.7 for the preceding week, with 105.1 for the corresponding week in 1946, with 94.0 for 1945, with 92.8 for 1944, and with 92.2 percent for the corresponding week in 1943.

Paperboard produticon for the week ended September 13 was 103.0 percent of capacity, compared with 79.0 percent for the preceding week, with 101.0 for the corresponding week in 1946, with 96.0 for 1945, with 97.0 for 1944, and with 98.0 for the corresponding week in 1943.

Since 1932 business men and Southern publishers have turned an investment of $100,000 in research into a multi-million dollar industry presenting a competitive threat to the Canadian newsprint monopoly. Already this Southern newsprint industry, which produces paper from the prolific Southern pine, reckons its operations at well over the $25,000,000 mark. It is now proceeding to triple its size. When the expansion program is completed in 1948 or 1949 it will give the South a newsprint supply of some 200,000 tons annually. While 200,000 tons annually will just begin to meet demands of Texas newspapers alone, it does provide the South with a perpetual supply of at least part of its needs. . . . Dr. Charles H. Herty began his experimenting with Southern pine as a possible raw material for newsprint back in 1933. In the process he interested a New York firm with Southern offices, eight Georgia daily newspapers, several individuals and even the State of Georgia, which gave him $20,000 for research. The newspapers, the Certain-Teed Corporation, and the individuals forked over money or materials to give the doctor around $100,000. On November 20, 1933, Georgia dailies published for the first time in history on stock made from native pine. It was nearly seven years, however, before the transition could be made from laboratory to commercial operation. Finally, the Southland plant was constructed and began operations in 1940. The production of the plant was snapped up quickly and in 1944 Southland completed an addition which gave it a capacity of 170 tons daily. Now Southland is spending $6,500,000 for a second addition to double its capacity. The newly organized Alabama firm, incorporated as the Coosa River Newsprint Company, has purchased 615 of the 18,500 acres owned by the Government at Childersburg and leased a number of buildings, including a 25,000-kilowatt steam plant.

From across the border we learn the Canadian Government has made it plain that it intends to guard against any infringement of Canada's sovereignty by the United States Department of Justice prosecution of complaints of "conspiracy among newsprint manufacturers operating in Canada to restrain trade in the United States." A senior official of the Canadian Government said at a news conference that the United States was perfectly within its legal rights to study Canadian operations of newsprint companies incorporated in the United States, but added the Canadian Government is watching carefully to insure that "enforcement of United States laws doesn't overstep in regard to Canadian sovereignty." Canadian sources indicated the Government was "sympathetic" regarding the irritation felt by newsprint manufacturers over the investigation, which they were said to feel was a "poor reward" for their efforts to meet United States newsprint requirements.

Wood Pulp

Imports of wood pulp into the United States from all sources totaled 258,542 tons in August as compared with 147,417 tons in August 1946, the Department of Commerce reports. Canada ranked as the principal supplier in August of both years, according to the Forest Products Division, Office of International Trade. Imports from Canada in August 1947 totaled 120,192 tons, an increase of 17,687 tons over August 1946.

Imports from Sweden in August 1947 were 91,949 tons or 59,972 tons more than in August of last year. Pulp imports from Finland amounted to 42,689 tons in August, while a year ago 12,935 tons were received. Imports from Norway in August 1947 amounted to 112 tons; no pulp was received from Norway in August 1946. . . . Of total imports of all grades in August, 21,279 tons were of rayon and special chemical grades of bleached sulphite, and the balance, 237,263 tons, was paper grade pulp.

Waste Paper

Despite the vacation season and lack of collection facilities waste paper dealers in August supplied Eastern mills with a fraction over 97 percent of their waste paper requirements. August collections exceeded last year's comparable period by about 5 percent in the East, according to the Eastern Conservative Committee of the Waste Paper Consuming Industries. Although August's consumption of waste paper in 1946 was greatest of any of the first nine months of that year, consumption in August this year exceeded it by nearly 3½ percent.

Indications point to a need of 700,000 tons of waste paper for the nation's mills during September. The only month to exceed this amount of collections in the first half of 1947 was April when 712,000 tons were collected. Meanwhile, prices continue firm with little or no changes.

Eliminate shutdowns due to SLIME
Use Du Pont
LIGNASAN-X
REG. U. S. PAT. OFF.
an improved bactericide and fungicide now water-soluble
"Lignasan"-X prevents the build-up of slime—keeps the system clean, all the way to the dry cans. It is ideal for use in preparing stock solutions—gives "over-the-week-end" protection and allows fast Monday morning starts.
You'll find that this slime-control agent not only minimizes shutdowns for washing the system, but acts also as an aid to prevent such production bottlenecks as sheets sticking to the press rolls, and smears, holes and breaks in the sheet caused by slime. Ask your Du Pont representative about "Lignasan"-X, or write for additional information.
DU PONT
REG. U. S. PAT. OFF.
BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Department, Wilmington 98, Delaware

PRICES

With the elimination of price controls on paper, pulp, rags and other materials, the quotations given below once more become indicative of trends in an open market. At the moment they can be of little more, for, while some volume business still is being done under contract at the figures given below, fluctuations representing special conditions are too varied and too frequent to permit prices to be given as representing a wholly stabilized market.

Paper

(Delivered New York)

Standard News, per ton—

Roll, contract	$87.50	to	$90.00
Sheets	$109.00	"	—

Kraft—per cwt.—Carload Quantities

Zone A, Delivered
40 lb. base weight

Superstandard Wrapping	$7.00	to	—
No. 1 Wrapping	6.50	"	6.75
Standard Wrapping	6.00	"	6.25
Standard Bag	5.75	"	6.25

Tissues—Per Ream 24x36 (480) 10 lb. Zone 1.

Wh. No. 1 Frd.	$1.65	to	$1.72
Wh. No. 1 M. G.	1.65	"	1.72
Wh. No. 1½	1.48	"	—
Wh. No. 2	1.55	"	—
Kraft Anti-Tar	1.38½	"	—
Kraft Unbl.	1.85	"	—
Manila No. 2	1.62	"	—

Toilet—Per Case of 100 rolls—1 M Sheets.

Unbleached	$5.50	to	$6.40
Bleached	6.50	"	7.60

Paper Towels—Per Case of 3750—Zone 1.

Wh. Jr. M'tif'd 9¼x9½	$4.85
Br. Sr. M'tif'd 10x12	3.45
Br. Jr. M'tif'd 9½x9¾	2.95
Br. Jr. Sgl. fold 10x10¾	3.10

Manila—per cwt.—C. l. f. a.

No. 1 Jute Tag	$13.80
Reg. Jute Manila	13.25
No. 1 Manila	9.75

Boards, per ton—

News	$92.50	"	—
Chip	90.00	"	—
Sgl. Mla. L1 Chip*	102.50	"	—
White Pat. Coated*	120.00	"	—
Kraft Liners 42 lb.	95.00	"	—
Binders Boards	126.00	"	—

* Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following prices are representative of distributors' resale prices, all deliveries in Zone 1: Rag Content Bonds and Ledgers—

White, Assorted Items
Bonds, per cwt.

Carton 4	C't'n	Ton
100% Rag Ext.		
No. 1	$55.00	$50.00	$48.00
100% Rag	46.50	43.00	41.25
75% Rag	35.00	32.50	31.50
50% Rag	31.50	28.75	27.50
25% Rag	28.00	25.50	24.50

Ledgers, per cwt.

100% Rag Ext.			
No. 1	$54.25	$50.00	$48.00
100% Rag	46.25	42.50	40.75
75% Rag	36.00	33.25	31.75
50% Rag	31.00	28.00	27.00
25% Rag	27.25	24.75	23.75

Sulphite Bonds and Ledgers—
White, Assorted Items
Bonds, per cwt.

No. 1	$19.25	$17.50	$16.80
No. 2	18.25	16.50	16.00
No. 4	16.75	15.25	14.50

Ledgers, per cwt.

No. 1	$20.25	$18.35	$18.60
No. 2	19.25	17.50	16.80
No. 4	17.75	16.25	15.50

Free Sheet Book Papers—
White, Cased Paper

(Per cwt.)	Case	Ton
No. 1 Glossy Coated	$19.40	$18.60
No. 2 Glossy Coated	18.15	17.35
No. 3 Glossy Coated	17.65	17.00

(Per cwt.)	Case	Ton
No. 1 Antique (Water marked)	$15.90	$15.25
No. 2 Offset	16.00	14.75
A Grade E. F.	13.90	13.30
A Grade S. & S. C.	14.40	13.70
B Grade E. F.	Nominal	
B Grade S. C.	Nominal	
C Grade E. F.	Nominal	
C Grade S. C.	Nominal	
D Grade E. F.	Nominal	
D Grade S. & S. C.	Nominal	

Wood Pulp

Domestic mill prices delivered with former OPA freight allowances.

	Per Short Ton		ADT
Groundwood	$75.00	to	$80.00
Unbleached Sulphite	115.00	"	117.00
Bleached Sulphite	121.00	"	125.00
Bleached Soda	115.00	"	120.00
Unbleached Kraft	112.50	"	120.00
Southern Kraft	102.50	"	112.50

Canadian mill Prices delivered with freight allowances unless otherwise specified:

	Per Short Ton		ADT
Select Unbleached Kraft (no freight allowance)	115.00	"	—
Unbleached Sulphite	115.00	"	117.00
Bleached Sulphite	125.00	"	155.00
Glassine Unbleached Sulphite (no freight allowance)	112.00	"	—
Bleached Soda	105.00	"	115.00
Groundwood	75.00	"	80.00
Sideruns Pulping News	75.00	"	80.00
Hardwood and Specialty Grades	Nominal		

Swedish Quotations
Ex. dock, New York

	Per Short Ton		ADT
Bleached Kraft	$150.00	to	156.00
Bleached Sulphite	151.00	"	158.50
Unbleached Sulphite	121.00	"	131.80
Unbleached Kraft	116.00	"	126.00

Finnish Quotations
Ex. dock, New York

	Per Short Ton		ADT
Bleached Sulphite	$175.00	to	—
Unbleached Sulphite	145.00	"	150.00
Unbleached Sulphate	140.00	"	—

New Domestic Cotton Cuttings

(Prices delivered Mill Plus Dealer's Commission)

White Shirt	$11.50	to	$12.00
Light Silesias	7.50		
Unbleached Muslin	11.50	"	12.00
White Back Blue Overalls	8.50		
Blue Overalls	7.75		
Unbl. Fancy Shirt	5.00	"	5.50
Light Percales	6.00	"	6.50
Light Prints	5.25	"	5.95
Washables	4.00		
Bleachable Khaki	6.00	"	6.50
Unbleachable Khaki	5.50	"	6.00
Cottonades	5.00	"	5.50

Old Domestic Cotton Rags

(F.O.B. Shipping Point Plus Dealer's Commission)

	Per 100 lbs.
No. 1 Whites Repacked	$4.50
No. 1 Whites Miscellaneous	4.25
No. 2 Whites Repacked	4.00
No. 2 Whites Miscellaneous	3.50
Blue Overalls	3.75
Thirds and Blues Repacked	3.00
Thirds and Blues Miscellaneous	2.50
No. 1 Roofing Rags	1.65
No. 2 Roofing Rags	1.55
No. 3 Jute Bagging	1.45
No. 4 Brussels and hard back carpets	1.45
No. 5A Roofing Rags	1.45

New Foreign Cotton Cuttings

(Prices delivered Mill)

	Per 100 lbs.		
New Dark Cuttings	$6.00	to	—
New Mixed Cuttings	6.50	"	—
Light Silesias	9.00	"	10.00
Light Flannelettes	8.00	"	9.00
New White Cuttings	13.00	"	15.00
Fancy Shirt Cuttings	9.00	"	10.00
Light Prints	8.00	"	10.00
Bleachable Khaki, No. 1	7.00	"	7.50
Unbl. Khaki, No. 1	6.25	"	6.75

Old Foreign Rags

(F.O.B. New York)

	Per 100 lbs.		
No. 1 White Linens	$14.00	to	16.00
No. 2 White Linens	12.00	"	13.00
No. 3 White Linens	8.00	"	9.00
No. 4 White Linens	8.00	"	9.00
No. 1 White Cottons	10.00	"	12.00
No. 2 White Cottons	8.00	"	9.00
No. 3 White Cottons	6.50	"	7.00
No. 4 White Cottons	5.00	"	5.50
Extra Light Prints	7.50	"	8.00
No. 1 New Light Prints	6.25	"	6.75
Med. Light Prints	5.25	"	5.75
Dutch Blue Cottons	5.25	"	5.50
Checks and Blues	4.00	"	4.25
Linsey Garments	3.00	"	3.75
Dark Cottons	2.50	"	3.00
Old Shopperies	2.50	"	3.00
New Shopperies	2.50	"	3.00

Bagging

(Prices to Mill, f.o.b. N. Y.)

	Per 100 lbs.		
Foreign Gunny, No. 1	$4.75	to	5.00
Domestic Gunny, No. 1	4.25	"	4.50
Light Wool Tares	4.50	"	4.75
Heavy Wool Tares	4.75	"	5.00
Bright Bagging	4.25	"	4.50
Foreign Manila Rope	6.00	"	7.00
Domestic Manila Rope	5.75	"	6.50
Jute Strings	4.50	"	5.00
No. 1 Sisal Strings	5.50	"	6.00
Mixed Strings	1.75	"	2.50

Waste Paper

Prices to Mills
(Dollars Per Ton)
F.o.b. New York, Baled

No. 1 Hard White Envelope Cuts, one cut	$125.00	to	$135.00
No. 1 Hard White Envelope Cuts	110.00	"	120.00
No. 1 Hard White Shavings, unruled	110.00	"	120.00
No. 1 Hard White Shavings, ruled	100.00	"	120.00
Soft White Shavings, one cut	110.00	"	120.00
No. 1 Soft White Shavings	90.00	"	100.00
Soft White Shavings, Misc.	80.00	"	90.00
No. 1 Fly Leaf Shavings	55.00	"	60.00
No. 2 Fly Leaf Shavings	50.00	"	55.00
No. 1 Groundwood Fly Leaf Shavings	30.00	"	33.00
No. 2 Mixed Groundwood Fly Leaf Shavings	(nominal)		
Mixed Colored Shavings	(nominal)		
Mixed Groundwood Colored Shavings	(nominal)		
Overissue Magazines	(nominal)		
No. 1 Heavy Books & Magazines	25.00	"	30.00
Mixed Books	15.00	"	20.00
No. 1 White Ledger	75.00	"	85.00
New Manila Envelope Cuttings, one cut	100.00	"	110.00
New Manila Envelope Cuttings	65.00	"	75.00
Extra Manilas	35.00	"	40.00
Mixed Kraft, Env. & Bag Cuttings	75.00	"	85.00
Kraft Envelope Cuttings	100.00	"	105.00
Triple Sorted, No. 1 Brown Soft Kraft	65.00	"	75.00
New 100% Kraft Corrugated Cuttings	75.00	"	85.00
No. 1 Assorted Old Kraft	40.00	"	50.00
New Jute Corrugated Cuttings	27.00	"	—
Old 100% Kraft Corrugated Containers	(nominal)		
No. 1 News	17.00	"	19.00
No. 1 Mixed Paper	15.00	"	17.00
Box Board Cuttings	16.00	"	—
White Blank News	75.00	"	80.00
Overissue News	(nominal)		
Old Corrugated	30.00	"	32.00
Mill Wrappers	22.00	"	25.00

Twines

All Prices Nominal
(F. o. b. Mill)
(Soft Fiber)

Coarse Polished—India	.26	to	.29
Fine Polished—Fine India	.31	"	.35
Unpolished—Paper Makers	.20	"	.26
Tube Rope	.22	"	.27½
Wrapping	.26	"	.33½
Cotton	.70	"	—
(Hard Fiber)			
Mex. Sisal	.21	"	.24
Manila	.33	"	—
(Hemp)			
Polished Hemp	.63	"	—

PHILADELPHIA

Domestic Rags (New)

(F.O.B. Eastern Shipping Point)

Shirt Cuttings—			
New White No. 1	.10½	to	.11
New White No. 2	nominal		
Light Silesias	.07½	"	.08
Black Silesias, soft	.06½	"	.07
New Unbleached	.10½	"	.11¼
Washable Prints	.06½	"	.07
Washable No. 1	.05	"	.05¼
Blue Overall	.07½	"	.08
Cottons—According to grades—			
Washable Shredding	.03½	"	.04
Fancy Percales	.06¾	"	.07¼
New Black Soft	nominal		
Khaki Cuttings—			
Unbleachable Cotton Cuttings	.06	"	.06½
Bleachable Cotton Cuttings	.07	"	.07½
Men's Corduroy	.05½	"	.06
Ladies' Corduroy	.05	"	.05½
Cottonades	.05½	"	.06

Domestic Rags (Old)

(F.O.B. Eastern Shipping Point)

White No. 1—Repacked	4.50	to	5.00
Mixed White	4.00	"	4.25
White No. 2—Repacked	3.50	"	3.75
Thirds and Blues—			
Miscellaneous	2.25	"	2.50
Repacked	2.75	"	3.00
Roofing Stock—			
Foreign No. 1	nominal		
Domestic No. 1	1.70	"	1.75
Domestic No. 2	1.60	"	1.65
Roofing Bagging	1.50	"	1.65
Old Manila Rope	6.50	"	6.50

Bagging

(F.O.B. Eastern Shipping Point)

Gunny No. 1—			
Foreign	nominal		
Domestic	4.50	to	5.00
No. 1 Clean Bright—			
Sisal Strings	.04	"	.04½
No. 2 Clean Bright—			
Sisal Strings	.03	"	.03½
Sisal Jute	.02¾	"	.03
Scrap—			
No. 1	4.00	"	4.50
No. 2	1.75	"	2.00

FOR MAXIMUM UNIFORMITY IN –

PROCESSING OF
FOOD WRAPPINGS

Specify DIAMOND PRODUCTS

- SODA ASH
- CAUSTIC SODA
- LIQUID CHLORINE
- CHLOROWAX*

*REG. U. S. PAT. OFF.

ALKALI

DIAMOND ALKALI COMPANY

PITTSBURGH 22. PA., *and Everywhere*

Wool Tares, heavy	4.75	"	5.00
New Burlap Cuttings	6.00	"	6.50

Old Papers

(F. o. b. Phila.)
Mill Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	$100.00	to	$115.00
No. 1 Hard White Shavings, unruled	100.00	"	—
Soft White Shavings, one cut	90.00	"	95.00
White Blank News	60.00	"	65.00
Soft White Shavings	80.00	"	—
No. 1 White Ledger	80.00	"	85.00
Ledger, Colored	67.00	"	70.00
No. 1 Heavy Books & Magazines	30.00	"	32.00
Overissue Magazines	nominal		
New Manila Envelope Cuttings	80.00	"	—
No. 1 Assorted Old Kraft	60.00	"	65.00
No. 1 Mixed Paper	15.50	"	—
Box Board Cuttings	15.00	"	—
Kraft Corrugated Cuttings	100.00	"	—
Old Corrugated	30.00	"	35.00
Overissue News	30.00	"	—
No. 1 News	18.00	"	20.00

BOSTON

Old Papers

(F. o. b. Boston)
Mill Prices, Baled

No. 1 Hard White Shavings, unruled	7.00	to	8.00
No. 1 Hard White Shavings, ruled	7.00	"	8.00
Soft White Shavings, Misc.	6.25	"	6.50
No. 1 Fly Leaf Shavings	1.65	"	1.80
No. 2 Fly Leaf Shavings	2.00	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	1.25	"	1.50
Mixed Colored Shavings	2.50	"	2.75
New Manila Envelope Cuts, one cut	5.00	"	5.50
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	3.50	"	3.75
Mixed Kraft Env. & Bag Cuttings	3.75	"	4.00
Kraft Envelope Cuttings	3.75	"	4.00
No. 1 Heavy Books & Magazines	2.50	"	2.60
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	4.25	"	4.50
Groundwood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	3.50	"	—
No. 1 Mixed Paper	—	"	.95
Overissue News	1.50	"	1.75
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.50	"	—
Jute Corrugated Cuttings	1.07½	"	—
Paper Strings	2.25	"	2.50

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	—	to	4.75
Domestic	—	"	4.75
Sisal Rope No. 1	6.00	"	—
Sisal Rope No. 2	5.50	"	—
Mixed Rope	5.25	"	—
Mixed Strings	2.00	"	2.50
Transmission Rope—			
Foreign	(nominal)		
Domestic	3.00	"	3.50
Manila Rope—			
Foreign	(nominal)		
Domestic	6.25	"	—
Soft Jute Rope	5.00	"	5.25
Jute Carpet Threads	6.00	"	—
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	—	"	4.75
Domestic	—	"	4.87½
South America	5.25	"	—
Wool Tares—			
Foreign	4.75	"	—
Domestic	4.75	"	—
Aust. Wool Pouches	5.00	"	5.25
New Zealand Wool Pouches	5.25	"	5.50
New Burlap Cuttings	6.00	"	6.50
Heavy Baling Bagging	5.25	"	5.75
Paper Mill Bagging	3.50	"	3.75
No. 1 Roofing Bagging	1.75	"	—

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.08	to	—
Fancy Percales	.07½	"	.08
New White No. 1	.11	"	.11½
New Light Flannelettes	.08	"	.08½
Canton Flannels, Bleached	.10	"	.11
Underwear Cutters, Bleached	.10	"	.11
Underwear Cutters, Unbleached	.11	"	.12
Silesias No. 1	.08	"	.08½
New Black Silesias	.05	"	—
Red Cotton Cuttings	.05	"	—
Blue Overalls	.08½	"	.09
Soft Unbleached	.11	"	.12
Blue Cheviots	.08½	"	.09
Fancy	.86	"	—
Washable	.86	"	—
Khaki Cuttings	.06½	"	.07¼
Corduroy	.03½	"	—
Khaki Canvas	.06¼	"	.06½
B. V. D. Cuttings	.10½	"	.11¼

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	to	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	2.00	"	—
No. 2	1.75	"	2.00
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.20	"	—
Quality C	.95	"	—
Old Manila Rope	6.00	"	—

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)
Mill Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	$110.00	to	$120.00
No. 1 Hard White Shavings, unruled	105.00	"	115.00
No. 1 Soft White Shavings	80.00	"	95.00
No. 1 White Ledger	55.00	"	65.00
No. 1 Heavy Books & Magazines	40.00	"	43.00
White Blank News	43.00	"	49.00
Mixed Kraft Env. & Bag Cuttings	75.00	"	85.00
No. 1 Assorted Old Kraft	45.00	"	55.00
Overissue News	28.00	"	—
No. 1 News	18.00	"	—
No. 1 Mixed Paper	12.00	"	—
Old Corrugated	30.00	"	—
Mill Wrappers	22.00	"	—

MARKETS

BLANC FIXE—Deliveries fair with supplies adequate and demand steady. Pulp is currently quoted at $55 per ton, in barrels, car lots, at works; and $60 less car lot same basis.

BLEACHING POWDER — Demand eased up somewhat although supplies remain tight. Shipments improved. Quotations are unchanged. Prices on bleaching powder range from $3 to $3.75 per 100 pounds.

CASEIN — Current prices on processed acid precipitated casein are quoted around 24 to 26 cents per pound for domestic grades and 28 to 32 cents for imported grades f.o.b. shipping point.

CAUSTIC SODA—Some improvement noted in shipments, market still tight. Solid caustic soda is reported at $2.85 per 100 pounds; flaked and ground offered at $2.25 to $3.25 per 100 pounds, car lots, at works.

CHINA CLAY—Demand steady, domestic grades in good supply. Domestic filler clay is currently $9 to $11 per ton, car lots. Coating clay is currently $15 to $30 car lots. Imported clay is currently quoted at from $18 to $35 per ton, in car lots, export warehouse.

CHLORINE — Market tight as demand continues strong. Lack of tank cars continues to hamper deliveries. Quantities unchanged. Chlorine is currently quoted at $2.25 to $3.75 per 100 pounds.

ROSIN — Gum rosin in drums per 100 pounds, net, in yard New York, car lots B, D, $8.25; E, $8.30; F, $8.48; G, $8.51; H, $8.60; I, $8.76; K,M,N,WG, $8.77; WW, $9.03 Wood rosin, per 100 pounds net, f.o.b., l.c.l. N. Y., B, $6.45; FF, $7.95; G, H, I, K, M, $8.52; N, $8.57; WG, $8.62; WW, $8.87; X, $8.97.

SALT CAKE — Demand continues strong with slight improvement in shipments. Prices remain unchanged. Domestic salt cake is quoted at $20 to $26 per ton in bulk.

SODA ASH—Demand active with no improvement in supply situation, previous orders filled. Contract orders prevail at the same high levels. Current prices, car lots, per 100 pounds, are as follows: in bulk, $1.10; in paper bags, $1.30; and in barrels, $1.70.

STARCH—Capacity production absorbed by active demand, export demand eased up. Starch prices continue strong with the pearl grade quoted at $6.97 per 100 pounds; powdered starch at $7.08 per 100 pounds, car lots, Chicago.

SULPHATE OF ALUMINA — Active demand covered by fair supplies. Quotations continue unchanged. The commercial grades are quoted at from $1.15 to $1.30 per 100 pounds, in bags, car lots, f.o.b. works. Iron free is quoted at $1.95 to $2.25 per 100 pounds in bags at works.

SULPHUR — Supplies ample to meet increasing demand. Annual contracts are quoted at $18 per long ton, f.o.b. mines; the price f.o.b. at Gulf Ports is $19.50 per long ton.

TALC—Domestic and French markets have eased up, prices remain steady. Domestic grades are currently quoted at from $16 to $30 per ton in mines; Canadian at $35 to $45 per ton. All prices in car lots.

Canada De-Controls Domestic Pulp Prices

(Continued from page 9)

companies believe that it is better to keep over-all supply to a maximum.

Fine paper products continue to roll out of Canadian mills at a still-rising tempo. Demand for all kinds of fine papers, however, continues at a record high, and officials see no appreciable easing in demand for some time. Companies representing this division of the industry produce more than 800 different varieties of paper, from fine book papers to toilet tissue and from special industrial papers to wrapping papers. Mills are getting basic materials in better supply than a year ago, but there is still a definite shortage in many essential chemicals and different types of pulp. Price increases have occurred during the year in wages and raw materials and there has been a consequent upward revision in sales prices.

One of the highlights of the year in fine paper making has been the first Canadian production of machine-coated papers at Port Arthur in the plant of Provincial Paper, Ltd. For the first time "coatings" are applied on the paper machine to both sides of the sheet as a continuous and integrated part of its manufacture. The process permits the sale of first-class coated paper for publishing and commercial purposes at very close to the price of uncoated super-calendered papers. Ultimate annual productive capacity to be reached early in 1948, when installations are completed of all ancillary finishing equipment, is estimated at 27,000 tons. This will provide a surplus for export over domestic needs, it is said. Production is currently running at about half full capacity.

Howard Smith Paper Mills, largest producer of fine papers in Canada, has undertaken a $10 million expansion program. The Cornwall plant will be modernized to boost production of pulp and fine papers, and construction of a $200,000 addition is already under way.

The E. B. Eddy Co., a wholly-owned subsidiary of Eddy Paper Co., which was incorporated June 1, 1946, for the specific purpose of purchasing the controlling share interest in the E. B. Eddy Co. for $7,975,000, has expended this year approximately $1 million on plant improvement. The plants are situated on the Ottawa River at Ottawa, Ont., and Hull, Que., and manufacture and distribute a wide range of pulp and paper products, including fine papers, newsprint and paper board.

An extensive program of plant rehabilitation and additions has been authorized by directors of Rolland Paper Co. and committments for mill machinery and equipment amounting to $322,000 have been made. The company makes and sells high-grade bonds, writing, ledger, air-mail, offset and mimeograph papers in its plants at Mont Rolland and St. Jerome, Que.

Specialty papers are practically free from control now and are able to capitalize to a greater extent on the high demand for products. Production of tissue, paper serviettes, wallpaper, toilet paper, etc., continues at record high levels. Shortages of raw materials, however, continue in some branches of the industry, particularly in the wallpaper business. During the year several companies got delivery of additional machinery and have been able to boost production substantially.

Canadian newsprint industry appears to be exceeding itself in production and exporting, which means much to the country's great need for U. S. dollars. In spite of Great Britain's ability to take all the paper she requires and the Australian restrictions, Canadian newsprint manufacturers expect to be able to dispose of all the newsprint they can produce for some time to come and at the favorable price of $90 a ton. These favorable circumstances are gradually working the industry into a much sounder position financially than has been the case for many years. There is plenty of pulpwood waiting to be turned into pulp and paper, as a result of last year's record cut. Much of it has still to be transported to the mills, however, before it is frozen in for the winter. Estimates have placed the 1946-47 pulpwood cut at better than nine million cords.

It's NEW

SMITH & WINCHESTER
MODEL "E"
UNDERCUT TRIMMER

A NEWLY designed Undercut Trimmer retaining the outstanding features of the Smith & Winchester Standard Undercut with many new features, for fast, safe, accurate, more convenient operation. Features include: Heavy one-piece base frame; hinged front table to take away stock from cutter after cut; knife, to cut stock, raises from below the table; anti-friction bearings on drive shaft; disc type friction clutch; back gauge operated by variable speed, reversible motor for close setting; push button controls; illuminated index tape.

The Model "E" Undercut meets the needs of the modern finishing department for high production, accurate trimming and safe operation.

Makers of PAPER BAG and PAPER MILL MACHINERY

Investigate the new Model "E" for your peacetime needs. Bulletin giving full particulars mailed on request.

1828

THE SMITH & WINCHESTER
Manufacturing Company
SO. WINDHAM, CONN.

Serving the Paper Industry Since 1828

Wayne Stages Meet On Package Problems

DETROIT—Tentative program plans for an Institute on Packaging and Material Handling technique being arranged by the Wayne University School of Business Administration and the Industrial Packaging Engineers Association call for a lively series of lectures, illustrations, and demonstrations which will be concerned with latest developments in these fields, according to Dr. Spencer A. Larsen, chairman of the department of general business and Institute director.

As outlined by co-chairmen, H. G. Diefendorf of the Wayne faculty and C. J. Carney, Jr., secretary of the Packaging Engineers Association, there will be a five-day program beginning September 29. Three and a half days will be devoted to discussion of the various phases of the subject matter by prominent authorities. In addition, the Transportation Division of the Board of Commerce is completing plans for a full day of a "field trip" program which will take the students into many of Detroit's most prominent industrial and commercial organizations. Here the students (many of whom will be from plants that are supplying component parts to Detroit industries) will have an opportunity to correlate the Institute lectures with the practical industrial approach. There will also be one-half day devoted to personal conferences between "students" and "teachers." At this time, individual problems will be discussed and the participants will get the sort of personalized attention which they would expect in a regular college class.

Briefly sketched there are three divisions of the subject matter being treated during the Institute aside from the field trips. These are packaging, material handling, and transportation. Each of these divisions is again subdivided into a series of lectures limited to thirty minutes. In turn, the lectures will be followed by from four to six "illustrations" or "demonstrations" pertaining to the lecturers and ranging in time from five to ten minutes each.

Each division will have its own outstanding feature. For example, J. G. Witte, Montgomery Ward and Company, will open the sessions with a discussion of "The Relationship Between Packaging, Material Handling and Transportation." Then will follow discussions on "Packaging for the Manufacturer" by W. B. Keefe of Westinghouse Electric Company, and "Packaging for the Merchandiser" by M. A. Grogel, Butler Bros., (Ben Franklin and Scott Stores).

Protective Packaging of the heavier types will be treated both for domestic and export shipments, and there will be a special lecture on "Trends in Packing Material," by Paul Barcus of the Owens Illinois Container Laboratory.

A. V. Grundy, chief of the Container Research and Development Division of the Quartermaster Food and Container Institute will lecture on "Developments in the Food Packaging Field," and there will also be discussions on "Films" and "Foils."

Imports

(Continued from page 24)

WOODPULP BOARDS

Absorbo Beer Pad Co., Pacific Victory, Trieste, 160 bls.

Jay Madden Corp., Mormacpine, Helsingfors, 640 bls. (solid white).

ALBANY IMPORTS

Cellulose Sales Co., Malcolm M. Stewart, Stugsund, 895 bls. dry sulphite pulp; 3000 bls. dry sulphate pulp.

(———), Malcolm M. Stewart, Gefle, 508 bls. dry sulphite pulp.

Price & Pierce, Ltd., Malcolm M. Stewart, Wallvik, 6000 bls. dry sulphate pulp.

Pulp & Paper Trading Co., Malcolm M. Stewart, Hernosand, 1828 bls. 2nd quality strong sulphite pulp.

Cellulose Sales Co., Malcolm M. Stewart, Hernosand, 4500 bls. sulphite pulp.

Cellulose Sales Co., Malcolm M. Stewart, Sundsvall, 13,763 bls. kraft sulphate pulp.

NORFOLK IMPORTS

English China Clays Sales Corp., Montreal City, Avonmouth, 177 tons, 14 cwt. China clay.

Pulp Brotherhood to Comply With Taft Law

(Continued from page 9)

A Maine delegate declared that 50 percent of the locals in his state would collapse if the dues were increased as proposed, and Canadian delegates pointed to the discrepancy between the hourly base rates in Canadian mills and those in the United States. One worker said the base rate in his mill was 94 cents, compared to $1.275 just over the border.

Delegates supported a proposal for pensions for the union's international officers, representatives and clerical staffs. This provides $125 monthly for all union employes with 20 years or more of service and $100 monthly for those with 15 years or more. An initial pension fund of about $27,000 was set up, and it will be maintained to a maximum of $60,000 by diverting 1 cent from each monthly per capita tax paid.

Ivor Isaacson of Los Angeles was elected as tenth vice-president at the closing session of the convention Friday evening, September 20, defeating five other candidates after three roll calls. Other officers reelected unanimously were: Burke, president - secretary; Frank C. Barnes, Falls Church, Va., treasurer; and the following vice-presidents: Raymond Richards, Wisconsin Rapids, Wis.; W. H. Burnell, Cornwall, Ontario; S. A. Stephens, Thorold, Ontario; John Sherman, Tacoma, Wash.; Fred W. Morris, Madison, Maine; L. P. LaCroix, Three Rivers, Quebec; James S. Killen, Washington, D. C.; Joseph Tonelli, New York City; and Homer L. Humble, Mobile, Ala.

Acting on the request of President John B. Burke, delegates to the convention overrode a recommendation by a committee that it adopt a resolution seeking to curtail production in the paper industry. The resolution, seeking a forty-hour work week for Canadian paper workers, also proposed a curtailment of paper production to prevent a "flooded" market. The delegates voted down the committee's recommendation after Burke challenged the logic at this time of a program of scarcity.

MEISEL MACHINERY IS HELPING IN ALL FIELDS

Cigarette	**Wax**	**Photographic**	**Jet Propulsion**
Condenser	**Grease Proof**	**Snap-out Forms**	**Aero-engine Parts**

MEISEL PRESS MFG. CO. **950 Dorchester Ave., Boston**

RHOADS *Tannate* LEATHER BELTS

only a "PART OF A PART" but so VITAL to Production...

that a number of today's largest, most important paper machines are being equipped with TANNATE Leather Belts. They cost less than 1% of the total value of the machines . . . yet, save thousands of dollars with their continuous, trouble-free, production-increasing performance.

You, too, can keep production up and shutdowns down with Rhoads TANNATE Leather Belts because:

TANNATE Leather Belting . . . has HIGH POWER TRANSMITTING CAPACITY . . . keeps machines running at full load. TANNATE Leather Belting . . . TRANSMITS FULL LOAD EVEN WHEN DAMP . . . withstands high temperatures, water, machine oil and many chemicals better than most Leather Belting. TANNATE Leather Belting . . . is STRONGER THAN MOST OAK BELTING . . . stays on the job longer, requires little attention.

Our Engineering Department will be glad to consult with you on your belt drives.

PRODUCERS OF FINE LEATHER FOR 245 YEARS

J. E. RHOADS & SONS

35 NORTH SIXTH ST., PHILA. 6, PA.

NEW YORK • CHICAGO • ATLANTA

ESTABLISHED 1702

GREAT ATLANTIC PAPER CO. Inc.
10 East 43rd St., New York 17, N. Y.
Telephone: MUrray Hill 2-7830

Serving the Paper Industry since 1896

NATIONWIDE DISTRIBUTORS
MILL AGENTS AND CONVERTERS

PRINTING
and
WRAPPING PAPERS

BOOK • BOND • WRITING
NEWSPRINT

ROTO • MAGAZINE PRINTING • INDEX
COATED • POSTER • BRISTOL
MIMEOGRAPH • MANIFOLD • OFFSET
WRAPPING • LEDGER • TABLET • KRAFT
GROUNDWOOD • TAG • TISSUE
M.G. • ENVELOPE

ATTENTION
PAPER MILLS

We invite contacts with mills seeking dependable and reliable sales service.

Make Great Atlantic in New York your Eastern Sales Headquarters.

DIGESTED

Before an employer can agree to a union shop, under the terms of the Taft-Hartley Act, the union must be the authorized bargaining agent of the workers, and a majority of all employes in the unit, in an election conducted by the NLRB, must vote to authorize the union to conclude the agreement.

This places the employer in a dilemma. He is not required by the law to accept a union shop, although he must recognize the union as the bargaining agent of the workers. He cannot refuse to bargain with the union on the matter of union security. Neither can he agree to the union shop until the election has been held and the vote permits such a set-up.

Some employers—particularly those with current and soon-to-expire closed and union-shop agreements—are planning to forestall trouble with the union by giving the latter a "promissory agreement." The purpose of the latter is to assure the union that once the election of the employes is held, and a majority approves, the company will automatically sign the legal form of union shop contract, without further bargaining. Such an agreement eliminates any subsequent claims on the part of the labor organization that the company is "stalling" on the issue.—*Labor Relations Institute.*

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1947		Corresponding Weeks—1946	
August 9	105.1	August 10	103.4
August 16	104.8	August 17	104.5
August 23	103.7	August 24	106.1
August 30	104.1	August 31	105.6
September 6	84.7	September 7	86.7
September 13	*107.8*	September 14	105.1

COMPARATIVE MONTHLY SUMMARIES

1946							
		June	104.6	Dec.	97.0	Mar.	106.1
Jan.	94.7	July	94.0	Year Avg.	*101.1*	Apr.	105.1
Feb.	98.4	Aug.	104.7			May	106.2
Mar.	104.4	Sep.	101.3	1947		June	106.0
Apr.	102.7	Oct.	106.4	Jan.	102.1	July	93.5
May	100.7	Nov.	105.5	Feb.	105.9	Aug.	*104.2*

COMPARATIVE YEARLY SUMMARIES

	1940	1941	1942	1943	1944	1945	1946	1947
Year to Date	86.2	94.7	92.4	88.0	87.7	87.8	99.9	*103.3*
Year Average	85.6	97.4	90.4	87.8	88.1	89.4	101.1	

PAPERBOARD OPERATING RATIOS†

Current Weeks—1947		Corresponding Weeks—1946	
August 9	97	August 10	96
August 16	100	August 17	98
August 23	100	August 24	100
August 30	99	August 31	100
September 6	79	September 7	83
September 13	*103*	September 14	101

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1946	90	91	100	99	94	97	89	99	96	100	99	92	96
1947	99	103	101	100	101	101	90	99					

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

EDITORIAL

Neighborhood Problems

Canadian public opinion is expected to support the stand of the Dominion Government—that the United States has "no right" to take any action which will infringe on Canadian sovereignty in its current investigation into an alleged newsprint combine. That same public opinion it is reported was dead against the attempt of the Securities and Exchange Commission when it tried to get the Extradition Treaty amended a few years ago so that Canadians might be taken down to the United States for any violation, innocent or otherwise, of the many thousands of security regulations and laws south of the border. It supports the stand taken by newsprint executives in Canada who have refused to answer a summons of this character as illegal and arrogant.

The proposed visit to Toronto and other places on October 7 and 8th of the members of the Newsprint Committee of the U. S. House of Representatives, headed by Clarence J. Brown, is in another category.

It was far different, however, when the U. S. Department of Justice last March issued subpoenas against the Canadian companies, ordering them to appear in a New York district court and to bring from Canada voluminous files and data regarding their business. It was not even thought necessary to refer the matter to the Canadian government. W. G. Chandler of the Scripps-Howard Newspapers visited Canada in August for the express purpose of finding out how the whole matter was regarded in the Dominion. His reports show that no one minced matters.

Mr. Chandler found members of the industry itself indignant at the suspicion expressed that there was a conspiracy against U. S. consumers to restrict supply or rig prices. They were particularly incensed over the declaration of an official that "Canadian newsprint producers have a long bad record and may properly be suspected of being criminals." That was regarded as showing an utter ignorance of what the Canadian industry has done in supplying the United States. It is far from the best American tradition of a "good neighborly" policy.

More than that, Mr. Chandler reports these feelings shared by Canadian Government people, people in Canadian banks and financial institutions, and by Canadians in general who know what is going on.

The main issue in Canadian minds, says Mr. Chandler, is one of Canadian sovereignty and independence. In this particular instance the Canadian parties directly affected happen to be newsprint companies but Canadians assert that the issue would be the same if the companies were manufacturers of boots and shoes or washing machines. Canadian resentment in this case is aggravated by the fact that newsprint is Canada's greatest industry, using vast areas of publicly owned forests under government supervision, and that it has a record of remarkable performance in providing United States consumers with the largest supply in history at the lowest market prices in the world.

Mr. Chandler believes that the business of good relationship between Canada and the United States concerns every intelligent publisher, American or Canadian. He says there is no doubt that it is being strained by the Department of Justice's newsprint tactics, in conjunction with the recent coal-car embargo episode.

During the five war years of 1940-44 the Canadian mills, in their shipments to United States consumers, exceeded the prewar average by 345,000 tons a year or 15 per cent.

Wartime controls and allocation of Canadian newsprint terminated at the end of 1945. In 1946, under individual enterprise, Canadian newsprint mills made a new record by shipping to United States consumers 3,355,000 tons. This exceeded the 1945 allocation amount by 800,000 tons or 32 per cent. It bettered the prewar average by over 1,000,000 tons or 47 per cent.

In 1947 the Canadian mills are setting a still higher record in their shipments to U. S. customers. On performance this year to date, Canadian shipments to United States in 1947 may exceed 3,650,000 tons. This figure is 1,106,000 tons, or 43 per cent, above the last government allocation figure in 1945 and about 60 per cent higher than the prewar average. It is a gain of over 300,000 tons, or about 10 per cent, over the 1946 record.

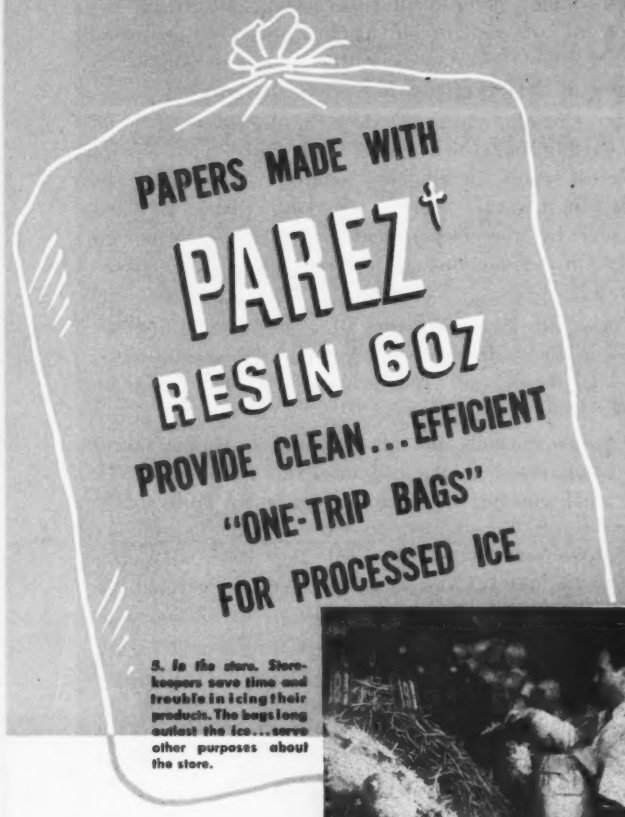
The United States newsprint committee has invited newspaper publishers and others interested to attend conferences at the Royal York Hotel during their stay. Besides the chairman the committee will include Representatives Charles Wolverton (Rep., N. J.), Paul Shafer (Rep., Mich.), Charles Vursell (Rep., Ill.), Lindley Beckworth (Dem., Tex.), Richard Harless (Dem., Ariz.), and Robert Sikes (Dem., Fla.).

The committee will inspect the Thunder Bay Mill of the Abitibi Power & Paper Co. Ltd., at Fort William, Ont., October 11th, proceeding to Chicago October 13th. They will then inspect newsprint mills in the Mid-Western and Southern United States, and also visit sites of proposed new mills planning new paper manufacturing processes in Georgia. They should be able to tell the U. S. Department of Justice a great deal it does not know about the industry when they get back to Washington.

EDITOR

W. L. Cook

Wet Strength Paper Scores Again... in a new "BIG DEMAND" item!



1. *In the plant.* Popularity of the new bags begins with the ice manufacturer. Filling and weighing, for instance, become one quick, simple operation.

2. *On the truck.* Delivery is more efficient. Bags remain dry and easily handled...there's no pick-up of used containers to bother with.

3. *In the home.* Hostesses . . . like hotel and restaurant chefs . . . find chipped ice that comes in the handy bags as sanitary as the food itself.

5. *In the store.* Storekeepers save time and trouble in icing their products. The bags long outlast the ice...serve other purposes about the store.

Photos courtesy Union Bag & Paper Corp.

4. *At the refreshment counter...* in stores, hotels, restaurants or in the home, cubed ice that's packaged for easy handling is appreciated.

Yes, Cyanamid's PAREZ Resin 607 has helped create another big, profitable market for paper manufacturers! Now it's "one-trip" wet-strength paper bags for the efficient marketing of cubed and sized ice to homes, restaurants, hotels and food stores.

No longer must the ice manufacturer buy and maintain returnable-type containers that have to be sterilized and stored for future use. Customers, too, like these strong, drip-proof paper bags that make processed ice easy to buy and handle.

Along with their increased sales and profits, paper manufacturers find PAREZ Resin 607 extremely easy to use. Simply added during the paper manufacturing process, it imparts increased wet and dry strength . . . improved tensile and bursting strength . . . added folding resistance . . . enhances the versatility and usefulness of the paper in general.

Is your business paper or packaging? Then consult Cyanamid's Technical Service representatives. They'll gladly show you how PAREZ Resin 607 can improve *your* products . . . open to *you* the new and profitable markets this remarkable resin is finding for paper.

WHEN PERFORMANCE COUNTS...CALL ON CYANAMID

Industrial Chemicals Division

AMERICAN CYANAMID COMPANY

30 ROCKEFELLER PLAZA • NEW YORK 20, N. Y.

Waxes • ALWAX** Sizes • WAXINE*
Sizes • Rosin Size • PAREZ* Resins
Synthetic Resins • Casein • Alum
Sulfonated Oils • Fillers • Defoamers
Soda Ash • Caustic Soda • Salt Cake
Acids • Clays • AEROSOL*
Wetting Agents • CAL
MICRO** (Calcium Carbonate), and other Paper Chemicals.
*Reg. U. S. Pat. Off. **Trade-mark

DISTRICT OFFICES: Boston, Massachusetts; Philadelphia, Pennsylvania; Baltimore, Maryland; Charlotte, North Carolina; Cleveland, Ohio; Chicago, Illinois; Kalamazoo, Michigan; Detroit, Michigan; St. Louis, Missouri; Azusa, California; Seattle, Washington. In Canada: Dilions Chemical Company, Ltd., Montreal and Toronto.

†Trade-mark of American Cyanamid Company covering its synthetic resins for use by the paper industry. The processes under which PAREZ is applied in the production of wet-strength paper are covered by U. S. Patents Nos. 2,291,079, 2,291,080 and 2,345,543 and U. S. Patent Application Serial No. 453,032.

For low-cost chemical equivalent of distilled H_2O . . . FILT-R-STIL* Demineralizing Units.

SECTION OF THE

TECHNICAL ASSOCIATION
OF THE PULP AND PAPER INDUSTRY

122 E. 42nd ST., NEW YORK 17, N. Y. Edited By R. G. MACDONALD, Secretary

Experiments on the Grinding of Quaking Aspen and Use of Pulp in Printing Paper*

By Axel Hyttinen,[1] G. E. Mackin,[2] and E. R. Schafer[3]

Abstract

Groundwood pulping experiments on quaking aspen, in which various stone-surface conditions and speeds, pressures of wood on stone, grinder pit temperatures, and pulp consistencies were used, were made at the Forest Products Laboratory. A dull stone-surface condition is preferable to a sharp condition for the production of pulp in the freeness range used for printing papers. For a given quality of pulp the production rate is higher and the energy consumption is lower, with a dull than with a sharp stone-surface condition.

At a stone-surface speed of 3,468 feet per minute, the effect of increasing the grinding temperature stepwise from 125 to 185° F. with the consistency constant, was principally to increase the freeness of the pulp. This effect was less pronounced with a dull stone-surface condition than with a sharp one. At a stone-surface speed of 4,185 feet per minute, there appeared to be no important effect attributed to varying the temperature between 150 to185° F. or the consistency between 1.8 and 5%.

A comparison of the effects of these two speeds at equal energy consumptions for a given stone-surface condition showed that the grinding rate and freeness were generally higher and the strengths generally lower for the higher speed.

A comparison of spruce and aspen ground under the same conditions showed a lower grinding rate, a higher energy consumption, higher strength, lower freeness, and shorter average fiber length for the spruce than for the aspen. To produce pulps of equal strength, aspen would require much higher energy consumption than spruce.

Five aspen groundwood pulps, each made under a different stone-surface condition, were each used in three book-grade paper furnishes. Wet-web strength was found low, but no significant changes in paper-machine operation were required to meet the conditions established for a standard commercial book furnish. In general, the aspen groundwood tended to produce a well-formed sheet with good appearance. The aspen groundwood, however, tended to cause higher sheet density, lower porosity and opacity, and, with one or two exceptions, lower strengths than were obtained when spruce groundwood was used. The lower porosity reduced the amount of coating that could be applied, an objection that might be overcome by adjusting the proportional amounts and the types of pulps used. The aspen groundwood did not impair the printability of the paper.

Aspen was among the first species to be used in the groundwood pulping process, but its use as groundwood pulp never developed to large proportions because of the at one time greater abundance of more preferable species, such as spruce, balsam, and hemlock. The supplies of the preferred species have been heavily drawn upon for mechanical as well as for chemical pulping, the demand for them has resulted in increasing difficulty in securing wood of these species in sufficient quantity and at reasonable cost for groundwood pulping. It has long been realized that other species must eventually be used to supplement and, in some regions, perhaps to replace entirely the preferred species if the present high production of groundwood is to continue.

Aspen has received considerable attention as a possible supplement or substitute for groundwood pulps of the preferred species because of its general availability and lower cost. Further, it is realized that the cutting of aspen would improve existing softwood stands in forests. It is reported (2,) that the aspen used for groundwood pulping in some mills amounts to as much as 15% of their total groundwood production. The available supply of aspen would, of course, permit its much more extensive use. Aspen groundwood should be studied intensively not only to determine its use as a substitute for spruce but, equally or more important, to develop uses which utilize its particular properties to the fullest extent.

Although small quantities of aspen have been used for groundwood pulping for a good many years, published technical information on such use is fairly limited. Thickens and McNaughton *(3)* found that aspen required a duller stone surface and a higher energy consumption than spruce. Munro *(1)* noted that under the same conditions of grinding, the free-

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 24-27, 1947.

[1] Chemical Engineer, Forest Products Laboratory,[4] Forest Service, U. S. Department of Agriculture.
[2] Member TAPPI; Technologist, Forest Products Laboratory,[4] Forest Service, U. S. Department of Agriculture.
[3] Member TAPPI; Chemical Engineer, Forest Products Laboratory,[4] Forest Service, U. S. Department of Agriculture.
[4] Maintained at Madison 5, Wis., in cooperation with the University of Wisconsin.

ness of aspen pulp was much higher than that of spruce, and provided the grinding pressure be the same, he suggested the use of a 9- or 10-cut, 2½- to 3-inch-lead, spiral burr for aspen instead of the 8-cut, 1½-inch-lead, spiral burr used for spruce. He considered a high-lead, spiral burr better than a No. 12 or 14 straight or diamond burr, also recommended moderate pressure and pit temperature. The strength of aspen pulp, according to Munro, was about half of that of spruce. The experiments of Wynn-Roberts (4) showed that aspen consumes much more energy than does spruce for the same strength of pulp. Running (2) reports the strength of aspen to be about one-half to two-thirds that of spruce ground under the same conditions.

A study of the grinding of aspen and the use of its groundwood pulp in printing and specialty papers is being conducted at the Forest Products Laboratory. This report, covering part of the study,* includes experiments showing the effect of grinding pressure, grinder pit temperatures, and pulp consistency, at various stone-surface conditions, on production rate, energy consumption, and properties of the pulp. Representative pulps were used in experiments on making paper of book grade.

* Acknowledgment is made of the cooperation in this work by the Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., the Kimberly-Clark Corporation, Neenah, Wis., and others.

Experimental Procedure

Wood Used and Its Preparation

The wood used for these experiments consisted of one shipment of seasoned white spruce pulpwood and three shipments of green quaking aspen (*Populus tremuloides*) pulpwood. The average physical characteristics of the wood in each shipment are given in Table I. The aspen (shipment No. 2259) used for experiments in part 1 of the study was ground at a peripheral speed of 3,468 feet per minute. The aspen (shipment No. 2188) used for experiments in part 2 of the study was ground at a peripheral speed of 4,185 feet per minute. The aspen (shipment No. 2217) used for duplicating certain runs in part 2 supplied extra pulp for the paper-machine experiments. The spruce (shipment No. 2229) was used in experiments in part 2 for comparing the grinding characteristics of spruce and aspen.

The logs were usually prepared for grinding in batches of fifty, except in the duplicating aspen runs and in the spruce runs, where 25 logs of each species were used. The bark was removed by hand, and then each log was cut into about 14 6-inch lengths, care being taken to avoid pieces from the dry ends of the logs or pieces having large knots or decay. The lot of wood used for a single grinding experiment consisted of one of the 6-inch pieces from each of the 50 logs, and amounted altogether to 130 pounds or more of wood (moisture-free basis). Thus each batch of fifty logs supplied wood for about fourteen experiments. In the duplicating aspen runs and in the spruce runs, two pieces were taken from each of the 25 logs, thus supplying wood batches for seven experiments. It is believed that by this method of wood preparation, whereby a large number of logs were sampled for each grinder run, the wood from run to run in most of the experiments was comparable. Some difference in dryness existed between the wood used for the various stone-surface conditions because of its further seasoning due to the unavoidable lapse of time between its use from one stone-surface to the next. In part 1, the wood was green for the medium stone-surface condition, but it had dried from 52.0 to about 64.0% dryness before the dull and the resharpened stone-surfaces were ready for use. In part 2, the wood was 50.3% dryness when the experiments were made on the sharp stone surface, but it had dried to about 66.5% dryness by the time the experiments on the dull surface were completed.

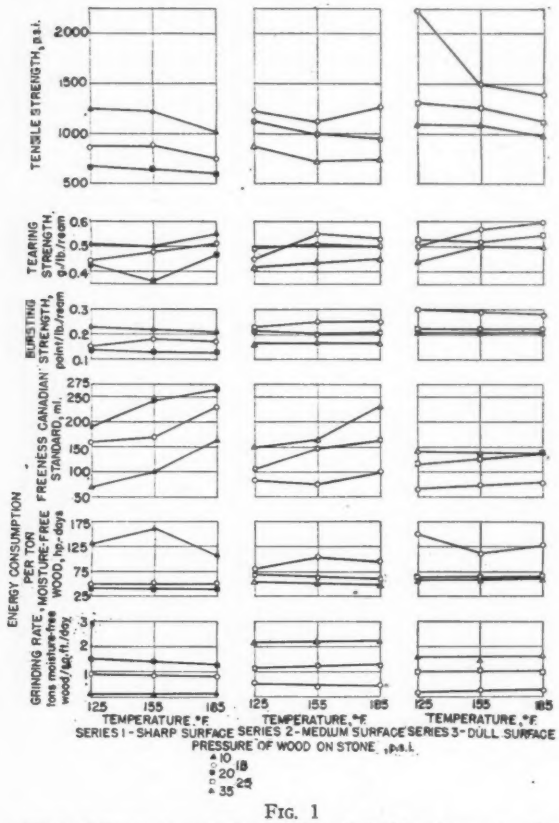


FIG. 1

Effect of Temperature in the Grinding of Quaking Aspen at a Surface Speed of 3,468 Feet Per Minute and Consistency of 3.0 to 5.0%.

Grinder Equipment and Method of Operation

The Forest Products Laboratory experimental grinder was used for these experiments. This grinder has three pockets 16 inches wide that take bolts of wood 6 inches long, and it is equipped with a pulpstone 54 inches in diameter by 8 inches wide. A 3760/5N7 Norton carborundum stone, dressed with a 10-cut, 1-½-inch-lead, spiral burr and a 14-point diamond burr was used for this work. The installation has automatic devices to maintain shower-water and grinder-pit temperatures at the desired constant values. Control of the shower-water temperature permits controlled variation of pulp consistency at constant grinder-pit temperatures. Before making a grinding experiment, the grinder and stone were gradually brought to the desired pit temperature with heated water. Immediately before starting the run, the temperature of the water in the pit was quickly lowered about 20° by running colder water into it. At this point the grinding was started. Because the pit temperature was below that set for the pit-temperature regulator, the shower-water valves were automatically closed during the first few minutes of the run. This control permitted the consistency of the pulp accumulating in the pit to rise quick-

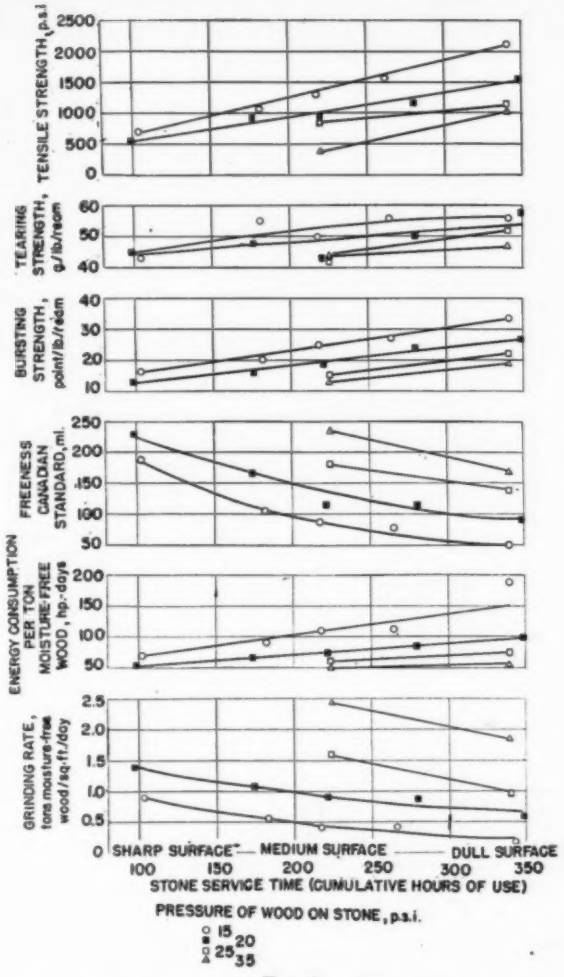


FIG. 2

Effect of Stone Surface Conditions in the Grinding of Quaking Aspen at a Surface Speed of 4,185 Feet Per Minute, Consistency of 3.0 to 4.5%, and Temperature of 165° F.

ly to a value approximately equal to that desired for the test. When the heat produced by the friction of the stone on the wood had caused the pit temperature to rise to that set by the controller, shower-water was automatically admitted to maintain the pit temperature. Slight adjustment of the shower-water temperature was then made, if necessary, to obtain the desired consistency.

The groundwood pulp was run through a sliver screen and a flat-plate screen fitted with 8-cut plates, then dewatered on a wet machine. Pulp test sheets were made of about 115-pound-basis weight (25-× 40—500), and were tested by TAPPI standard methods. The screen analysis of the pulps was made with the Appleton selective screen.

Description of Pulping Experiments

Most of the grinding experiments discussed in this report were carried out in two parts. In part 1, aspen was ground at a peripheral speed of 3,468 feet per minute. For each of three stone-surface conditions used, nine experiments were made, consisting of three grinding pressures at each of the three pit temperatures. Grinder-pit pulp consistencies were kept between 3 and 4%, except in a few instances in which 4% was inadvertently exceeded. Stone-surface condition was gaged by the freeness of pulp produced in trial runs at 15 pounds pressure and 155° F. Freeness values of approximately 200, 80, and 50 ml., Canadian Standard, were selected to represent the sharp, medium, and dull surfaces, respectively.

In part 2 a speed of 4,185 feet per minute was used to grind aspen and spruce. Experiments, identified as series A, B, C, D, and E, were made at each of five different stone-surface conditions, which represented progressively duller surfaces. Series A, C, and E were made to study the effect of varying the pressure, and series B and D were made to study the effect of varying the temperature and pulp consistency. Series A and B were made at stone-surface conditions intermediate to series 1 (sharp) and 2 (medium) of part 1. Series C and E were made at about the same stone-surface conditions used for the medium and dull surfaces, respectively, in part 1. One experiment with spruce was made with each of the five stone-surface conditions.

In part 2 an extra run duplicating one of the series was made at each surface condition. The duplicate runs were mixed to provide the pulp necessary for paper-machine experiments. Each of the five pulp mixtures were used in three different furnishes for book-grade printing paper.

Discussion

Pulping Experiments

The grinding and pulp-test data for the experiments made in part 1 are presented in Table II where they are grouped according to stone-surface conditions and arranged within such groups in temperature series for each of the three pressures employed. The data for the experiments made in part 2 are given in Table III, where they are grouped according to progressively duller stone-surface conditions and arranged within such groups in pressure, temperature, and consistency series.

Effect of Temperature and Consistency. At the lower speed (part 1), on the sharp stone surface, an increase in temperature, with the pressure constant at either 10, 15, or 20 p.s.i. of wood against the stone, resulted in a marked increase in freeness and a decrease in density of the test sheets but produced no significant effect on energy consumption, grinding rate, strength, or fiber length. With the medium stone-surface condition, an increase in temperature, with the pressure constant at either 15, 25, or 35 p.s.i., produced a less marked increase in freeness and decrease in density of the test sheet. With the dull stone surface, the effect of increasing the temperature, with pressure constant at either 15, 25, or 35 pounds, was almost negligible on the freeness but density of test sheets was decreased. Thus, at a given pressure, the effect of increasing grinding temperature from 125 to 155 to 185° F. was principally a tendency to increase freeness, except on the dull surface, and to decrease the density (namely to increase the bulk) of the test sheet. The strength was not, in general, affected by increase in temperature, although there appears to be a slight increase in tear and a slight decrease in tensile strength with practically no change in bursting strength. Figure 1 shows the foregoing observations on the effect of temperature at various pressures and conditions of stone-surface on grinding rate, energy consumption, freeness, and bursting, tearing, and tensile strengths for each of the three stone-surface conditions.

In the experiments made at the higher speed (part

TABLE I.—PROPERTIES OF WOOD USED IN GROUNDWOOD PULPING EXPERIMENTS

Shipment No.	Species	Average Diameter, inches	Average Age, years	Average Rate of Growth, rings per inch	Average Density,[1] lb. per cu. ft.
2259 [2]	Quaking aspen	6.8	36	10.6	23.6
2188 [3]	Quaking aspen	6.9	32	9.3	22.9
2217 [3]	Quaking aspen	6.5	35	11.5	25.0
2229 [3]	White spruce	6.3	76	24.2	25.0

[1] Average density equals weight when moisture-free divided by green volume.
[2] Used in experiments of part 1.
[3] Used in experiments of part 2.

2), the temperatures studied did not cover so wide a range as those at the lower speed. In series B, on a moderately sharp stone, increasing the temperature from 150 to 165 to 185° F., with pressure constant at 15 pounds and consistency at 3.5%, resulted in a slight trend toward greater energy consumption, lower strength, and lower density of test sheets. In series D, on a medium-dull surface, increasing the temperature from 150 to 165 to 185° F., with consistency constant at either about 2.0, about 3.5, or about 5.0% and the pressure constant at 20 pounds produced no consistent trends due to increase in temperature. In comparison, as already noted above, in experiments at the lower speed at medium stone-surface condition, the effect of increasing the temperature from 125 to 185° F. at 15 to 25 pounds pressure was principally that of increasing the freeness.

A study of the effect of pit consistency was made at the higher speed on the moderately sharp and medium-dull stone-surfaces. In series B, increasing the consistency from 1.6 to 3.5 to 4.2%, with the temperature constant at 165° F., produced no significant effects on grinding characteristics nor on pulp properties. Likewise, in series D, increasing the consistency from about 2.0 to about 3.5 to about 5.0%, with the temperature constant at either 150 ,165, or 185° F., produced no important effects, although there was a slight trend toward lower freeness and higher energy consumption with increasing consistency.

Effect of Pressure. The effects of increasing grinding pressure, with other conditions constant, were to increase the grinding rate, freeness, and fiber length, and to reduce energy consumption, and the strength and density of the pulp test sheet, which, for the most part, was to be expected. In general, greater change, proportionately, occurred in grinding rate and pulp freeness than in other effects and properties as the result of changes in pressure. Changes caused by pressure were generally less pronounced between 25 and 35 p.s.i. than between 15 and 25 p.s.i. These

TABLE II.—THE GRINDING OF ASPEN AT VARIOUS PRESSURES, TEMPERATURES, AND CONDITIONS OF STONE SURFACE. PART 1

Grinder Run No.	Grinding Data: Wood Dryness, %	Pressure of Wood on Stone,[2] lb. per sq. in.	Temperature: Of Grinding, °F.	Temperature: Shower Water, °F.	Consistency, %	Stone Service Time,[3] hr.	Grinding Rate Moisture-free Wood per 24 hr.,[4] tons	Power Input,[4] hp.	Energy Consumed per Ton Moisture-free Wood, hp.-days	Properties of Pulp Suspension: Freeness: Schopper-Riegler, ml.	Freeness: Canadian Standard, ml.	Screen Analysis: Retained Between: Retained on 24-mesh, %	24- and 42-mesh, %	42- and 80-mesh, %	80- and 150-mesh, %	Passing 150-mesh, %	Fiber Length Index	Properties of Pulp Test Sheets [1]: Bursting Strength 25×40—500, pt. per lb. per ream	Tearing Strength 25×40—500, gm. per lb. per ream	Tensile Strength: Lb. per sq. in.	Lb. per in. width	Density, g. per cc.	Brightness,[5] %
Series 1.—Sharp stone-surface condition																							
495	64.2	10	125	55	3.0	3.0	0.12	16	130	272	70	0.1	3.5	22.8	26.9	46.7	0.084	0.23	0.51	1,240	18.3	0.42	60.5
498	58.3	10	155	100	3.2	7.1	.08	13	161	350	100	.5	6.4	23.0	20.7	49.4	.083	.22	.50	1,231	18.4	.40	61.7
501	65.0	10	185	160	3.0	10.3	.13	16	117	497	165	1.2	13.2	23.2	18.5	43.9	.091	.21	.55	1,020	16.5	.38	60.0
496	64.2	15	125	90	3.0	6.0	.89	43	48	475	160	2.4	10.2	23.3	23.2	40.9	.094	.15	.44	860	13.8	.37	59.7
499	60.0	15	155	120	3.4	9.3	.80	43	54	500	170	1.0	10.7	22.6	20.0	45.7	.088	.18	.48	880	15.0	.36	61.1
502	65.2	15	185	160	4.3	12.0	.82	41	50	563	230	2.6	14.2	23.5	18.5	42.2	.094	.17	.51	760	13.4	.33	58.4
497	64.2	20	125	95	3.8	6.6	1.51	63	41	510	190	3.7	11.0	23.0	23.0	39.3	.097	.14	.44	671	11.6	.36	58.4
500	62.3	20	155	130	3.7	9.8	1.40	57	40	585	242	2.2	11.6	21.0	20.6	44.6	.093	.13	.36	640	10.6	.34	59.5
503	65.7	20	185	160	5.0	12.7	1.25	50	40	608	265	3.3	13.6	21.9	19.0	42.2	.094	.14	.47	597	11.8	.32	58.0
Series 2.—Medium stone-surface condition																							
446	52.0	15	125	[6]56	3.4	233.8	.56	46	80	368	83	1.1	12.6	23.4	18.0	44.8	.090	.23	.45	1,236	18.3	.42	62.8
440	52.0	15	155	60	3.3	227.1	.38	40	104	335	75	4.4	18.1	19.1	21.9	36.6	.103	.25	.55	1,120	17.2	.42	62.8
443	52.0	15	185	100	3.9	230.5	.47	43	93	383	100	4.0	13.9	19.8	18.9	43.4	.093	.25	.53	1,276	19.3	.42	60.7
447	52.0	25	125	[6]56	3.4	235.4	1.13	80	70	415	107	.2	12.8	20.8	22.8	43.5	.090	.22	.49	1,125	16.4	.42	61.0
441	52.0	25	155	75	3.6	229.4	1.27	81	64	470	147	3.2	19.5	17.7	18.7	40.9	.097	.20	.51	1,013	16.0	.39	62.3
444	52.0	25	185	125	3.8	232.5	1.30	79	61	500	165	4.1	20.4	19.3	19.1	37.1	.103	.21	.50	952	16.3	.38	62.2
448	52.0	35	125	65	3.5	236.2	2.14	116	54	470	150	4.3	16.1	19.7	21.4	38.5	.099	.16	.42	884	13.5	.40	62.3
442	52.0	35	155	100	3.4	230.1	2.25	124	55	495	167	1.8	14.2	20.7	23.8	39.5	.096	.17	.49	731	13.0	.35	62.0
445	52.0	35	185	140	3.9	233.2	2.21	107	49	567	232	9.8	24.5	17.8	17.2	30.7	.119	.16	.50	754	13.0	.36	58.8
Series 3.—Dull stone-surface condition																							
469	60.8	15	125	[6]60	3.2	353.4	.19	28	151	250	63	.1	4.0	24.2	18.5	53.5	.079	.30	.50	2,215	29.4	.47	55.5
473	60.8	15	155	60	3.4	357.0	.29	32	111	310	75	.2	7.2	25.7	20.3	46.6	.087	.29	.57	1,499	21.5	.42	58.0
474	60.8	15	185	95	3.4	358.1	.23	30	128	310	77	.5	10.4	26.6	17.3	45.2	.089	.28	.60	1,414	20.6	.41	58.6
470	65.5	25	125	[6]60	3.4	355.3	.99	64	65	412	115	1.1	10.9	24.9	18.3	44.8	.090	.22	.53	1,320	18.9	.42	58.8
471	65.5	25	155	80	3.5	355.9	1.03	68	66	425	128	1.2	10.5	22.6	18.8	46.9	.087	.22	.52	1,275	17.8	.40	57.0
475	65.5	25	185	130	3.5	359.4	.96	66	68	437	140	2.5	13.8	21.3	20.2	42.2	.093	.22	.55	1,123	18.8	.37	55.8
468	62.3	35	125	60	3.8	352.9	1.69	105	62	463	143	1.7	10.2	26.7	16.6	42.8	.091	.21	.44	1,094	15.5	.44	55.4
472	62.0	35	155	90	3.3	356.4	1.48	92	62	455	138	2.3	11.5	23.5	18.9	43.8	.091	.21	.51	1,080	15.8	.40	58.0
476	65.3	35	185	140	4.3	360.0	1.66	99	60	417	138	2.5	16.2	19.0	18.1	44.2	.092	.21	.50	994	15.9	.38	53.8

[1] Basis weight of test sheets, 115 pounds per ream.
[2] Actual thrust of the pressure foot (determined by calibration of the cylinder pressure) divided by the area represented by the product of the pocket width and wood length.
[3] A Norton stone 3760/5N7 was used. When this work was started, the stone had been in service 227 hours (based on three-pocket operation at 3,150 feet per minute speed) since last burring and was too dull for series 1. Therefore, series 2 and 3 were made first. Then the stone was dressed with a 10-cut, 1½-inch lead, spiral burr and a 14-point diamond burr as previously and series 1 made. The peripheral speed was 3,468 feet per minute with three pockets in use simultaneously except for runs 442, 445, 448, and 468, where only two pockets were used. Stone immersion was 9 inches.
[4] Per square foot of wood-stone contact area.
[5] Measured with Hunter reflectometer calibrated in accordance with TAPPI method T217 sm-42.
[6] Cooling coil used in grinder pit.

observations are shown in Table IV. For example, for the medium-sharp stone-surface and lower speed, changing the pressure from 15 to 25 p.s.i. caused an increase of 202% in grinding rate and 78% in freeness, whereas the reduction in energy consumption was 37%, and in other pulp properties, 18% or less. The corresponding changes caused by raising the pressure from 25 to 35 p.s.i. were an increase in grinding rate of 74%, and in freeness of 28%, with a decrease in energy consumption of 17% and of 24% or less in other pulp properties.

General trends in grinding effects and pulp properties with changing stone-surface conditions are shown for various pressures in Fig. 2. The lines representing tests made at given pressures are nearly parallel and illustrate how adjustments in pressure can be made to compensate for changes caused by the progressive dulling of the stone-surface.

Effect of Speed. Certain results caused by changing the surface speed of the stone from 3,468 to 4,185 feet per minute have been previously mentioned. For instance, at the lower speed, the principal effect of raising the temperature was to increase the freeness of the pulp, whereas, at the higher speed there appeared to be no important effects on grinding characteristics of the wood nor on the pulp properties that could be attributed to changes in temperature. In connection with effects caused by changes in pressure, it is shown in Table IV that the effects are proportionately greater in most cases at the higher speed than at the lower speed.

A comparison of the effects of the two speeds at nearly equal conditions of stone-surface, pressures, and temperatures (Fig. 3) shows no consistent trends in pulp properties, energy consumption, and production rate, although higher speed favored higher freeness in the majority of cases. On the other hand, if a comparison of the effect of speed is made without regard to the pressure and temperature but on the basis of equal energy consumption for given stone-surface conditions, as shown in Fig. 4, the grinding rate and freeness are found to be generally higher and the strengths generally lower at the higher stone speed.

Energy Relationships. For a given stone-surface condition, the strength of the pulp increased, in general, with increase in energy consumption. For a given energy consumption, the stronger pulps were produced by the duller surfaces. These relationships are shown in Fig. 4. The points plotted for the lower-speed experiments are the averages of the three different temperature runs at a given pressure and stone-

TABLE III.—THE GRINDING OF ASPEN AT VARIOUS PRESSURES, TEMPERATURES, CONSISTENCIES, AND CONDITIONS OF STONE SURFACE. PART 2

Grinder Run No.	Grinding Data: Wood Dryness, %	Pressure of Wood on Stone,[2] lb. per sq. in.	Temperature: Of Grinding, °F.	Temperature: Shower Water, °F.	Consistency, %	Stone Service Time,[3] hr.	Grinding Rate, Moisture-free Wood per 24 hr.,[4] tons	Power Input,[4] hp.	Energy Consumed per Ton Moisture-free Wood, hp.-days	Properties of Pulp Suspension: Freeness: Schopper-Riegler, ml.	Freeness: Canadian Standard, ml.	Screen Analysis: Retained between: Retained on 24-mesh, %	24- and 42-mesh, %	42- and 80-mesh, %	80- and 150-mesh, %	Passing 150-mesh, %	Fiber Length Index	Properties of Pulp Test Sheets[1]: Bursting Strength 25×40—500, pt. per lb. per ream	Tearing Strength 25×40—500, gm. per lb. per ream	Tensile Strength: Lb. per sq. in.	Lb. per in. width	Density, g. per cc.	Brightness,[5] %
Series A[6]																							
421	50.3	10	165	75	3.4	99	0.31	36	115	360	93	1.6	19.0	19.9	20.1	39.4	0.098	0.21	0.46	886	13.6	0.41	68.2
422	50.3	15	165	95	3.8	103	.91	62	69	463	188	3.8	22.1	20.2	17.5	36.4	.105	.16	.43	704	12.4	.35	68.0
420	50.3	20	165	113	3.4	98	1.42	81	56	537	230	7.4	23.7	18.9	17.3	32.7	.113	.13	.45	548	9.9	.34	68.0
Series B[6]																							
426	([7])	15	165	137	1.6	175	.56	51	90	418	115	1.7	18.8	20.0	20.1	39.4	.098	.21	.56	1,144	17.8	.40	66.0
429	([7])	15	165	80	3.5	183	.57	53	93	407	103	1.1	20.6	18.1	21.4	38.8	.099	.20	.55	1,142	18.8	.39	62.2
427	([7])	15	165	56	4.2	178	.57	53	94	402	120	.8	14.8	20.8	19.2	44.4	.091	.20	.50	995	13.9	.39	67.2
430	([7])	15	150	65	3.5	187	.63	56	88	418	120	1.5	13.2	20.2	20.4	44.7	.090	.22	.60	1,200	17.6	.42	65.3
429	([7])	15	165	80	3.5	183	.57	53	93	407	103	1.1	20.7	18.1	21.4	38.8	.099	.20	.55	1,142	18.8	.39	62.2
431	([7])	15	185	105	3.5	189	.57	55	97	427	133	1.7	16.5	21.4	18.7	41.6	.084	.19	.55	893	14.2	.37	65.6
425	([7])	20	165	90	3.8	174	1.07	71	68	463	168	3.1	18.9	19.6	17.3	41.1	.097	.16	.48	856	14.5	.38	66.6
Series C[6]																							
434	([8])	15	165	73	3.3	217	.43	48	111	378	88	.1	14.8	18.9	22.5	43.7	.091	.25	.50	1,293	19.9	.44	66.8
436	([8])	20	165	85	3.7	222	.96	74	77	412	113	1.2	19.2	17.0	21.8	40.8	.096	.19	.44	970	16.2	.38	64.2
437	([8])	25	165	90	3.6	224	1.55	94	61	508	180	2.6	16.0	20.8	23.7	36.9	.100	.15	.42	682	11.6	.37	63.8
438	([8])	35	165	105	3.8	225	2.46	123	50	570	235	5.9	20.6	17.8	21.9	33.8	.108	.13	.44	469	8.6	.34	65.2
Series D[6]																							
451	([8])	20	150	110	2.1	269	.82	65	79	417	113	2.6	16.6	26.7	17.4	36.7	.103	.23	.44	1,244	19.7	.41	65.1
454	60.4	20	165	140	1.8	273	.83	64	77	450	140	2.1	14.9	25.9	18.0	39.1	.099	.22	.55	1,240	18.9	.41	66.4
452	([8])	20	185	155	1.8	270	.84	67	79	447	127	3.5	18.3	23.1	17.4	37.7	.102	.23	.54	1,266	20.3	.39	67.4
449	([8])	20	150	70	3.6	265	.93	70	75	447	130	2.3	12.9	23.7	18.5	42.6	.093	.22	.51	1,037	16.1	.41	68.9
457	([8])	20	165	70	3.9	278	.81	69	84	405	118	1.9	12.6	25.0	18.2	42.3	.094	.24	.50	1,358	19.4	.42	58.0
459	60.7	20	185	110	3.5	280	.80	66	82	393	110	1.5	12.4	27.4	18.3	40.4	.096	.24	.53	1,463	21.3	.43	60.2
456	55.7	20	150	57	5.0	276	.74	61	83	402	127	1.3	10.7	25.6	19.0	43.4	.092	.21	.56	1,251	19.8	.41	59.2
455	63.7	20	165	56	5.2	274	.75	64	86	390	110	1.4	12.5	26.5	16.3	43.3	.093	.23	.52	1,318	19.9	.41	67.4
453	([8])	20	185	100	4.5	272	.80	67	84	410	100	2.2	11.9	25.3	15.8	44.8	.091	.23	.51	1,306	20.3	.41	68.7
450	([8])	15	165	70	3.8	266	.43	48	112	350	78	.2	13.7	26.5	18.3	41.3	.095	.27	.56	1,593	24.6	.41	68.1
Series E[6]																							
465	66.5	15	165	60	3.1	343	.17	32	189	230	50	.3	4.0	22.9	15.6	57.2	.076	.34	.56	2,150	27.5	.46	60.0
466	65.7	20	165	70	3.3	349	.60	60	101	350	95	.5	8.0	27.3	15.8	48.4	.086	.27	.58	1,670	23.4	.43	60.4
463	61.1	25	165	90	3.6	339	.98	76	77	435	140	1.7	12.4	28.0	17.8	40.1	.097	.22	.52	1,122	17.3	.40	59.2
462	66.3	35	165	95	4.5	338	1.85	108	58	487	170	4.4	14.3	26.1	18.2	37.0	.102	.19	.47	1,116	15.4	.41	60.4

[1] Basis weight of test sheets, 115 pounds per ream.
[2] Actual thrust of the pressure foot (determined by calibration of the cylinder pressure) divided by the area represented by the product of the pocket width and wood length.
[3] A Norton stone 3760/5N7 was used. Stone service time at the start of each run is the accumulative hours of operation (based on three-pocket operation at 3,150 feet per minute) since burring with a 10-cut, 1½-inch lead, spiral burr and a 14-point diamond burr. Peripheral speed used in the experiments was 4,185 feet per minute with three pockets in use simultaneously. Stone immersion was 9 inches.
[4] Per square foot of wood-stone contact area.
[5] Brightness measured with Hunter reflectometer calibrated in accordance with TAPPI method T-217 sm-42.
[6] Series A, B, C, D, and E were made on a progressively duller stone surface. The surface for A was considered fairly sharp, that for E was dull.
[7] Exact dryness of wood not determined at time of grinding but probably slightly more than 50.3%.
[8] Dryness of wood probably about 60%

TABLE IV.—EFFECT OF PRESSURE CHANGES IN THE GRINDING OF QUAKING ASPEN

Pressure [2] from lb.	Pressure [2] to lb.	Change in Grinding Effects: Increase in Grinding Rate, Moisture-free Wood per 24 hours [3] [4] — Speed of Stone 3,468 f.p.m. %	Increase in Grinding Rate, Moisture-free Wood per 24 hours [3] [4] — Speed of Stone 4,185 f.p.m. %	Reduction in Energy Consumed per Ton Moisture-free Wood — Speed of Stone 3,468 f.p.m. %	Reduction in Energy Consumed per Ton Moisture-free Wood — Speed of Stone 4,185 f.p.m. %	Change in Properties of Pulps [1]: Increase in Fiber Length Index — Speed of Stone 3,468 f.p.m. %	Increase in Fiber Length Index — Speed of Stone 4,185 f.p.m. %	Increase in Freeness, Canadian Standard — Speed of Stone 3,468 f.p.m. %	Increase in Freeness, Canadian Standard — Speed of Stone 4,185 f.p.m. %	Reduction in Bursting Strength 25×40—500 — Speed of Stone 3,468 f.p.m. %	Reduction in Bursting Strength 25×40—500 — Speed of Stone 4,185 f.p.m. %	Reduction in Tearing Strength 25×40—500 — Speed of Stone 3,468 f.p.m. %	Reduction in Tearing Strength 25×40—500 — Speed of Stone 4,185 f.p.m. %	Reduction in Tensile Strength — Speed of Stone 3,468 f.p.m. %	Reduction in Tensile Strength — Speed of Stone 4,185 f.p.m. %
				Medium-sharp stone surface. Service between 217 and 232 hours [4]											
15	25	202	260	37	45	2	10	78	105	18	40	7	16	18	47
25	35	74	59	17	18	7	7	28	30	20	13	2	5	24	31
				Dull stone surface. Service between 338 and 358 hours [4]											
15	25	282	480	44	59	2	28	76	180	23	35	9	7	18	50
25	35	58	89	24	25	2	5	3	21	5	14	6	10	14	0

[1] Basis weight of test sheets, 115 pounds per ream.
[2] Per square inch of wood-stone contact.
[3] Per square foot of wood-stone contact.
[4] A Norton stone 3760/5N7 was used. Stone was dressed with a 10-cut, 1½-inch lead spiral burr and a 14-point diamond burr. Runs at the higher speed were made at 165° F. pit temperature. Data for the lower speed are the average of runs made at 155° and 185° F. pit temperature. All experiments were made at about 3.5% consistency.

surface condition (Table II). The points plotted for the higher-speed experiments are the data given in Table III for series A, C, and E.

Figure 4 also shows that, generally, for a given strength, the grinding rates are higher and the energy consumptions lower with duller surfaces than with sharper surfaces. For example, by interpolation, a pulp with a bursting strength of 0.22 point per pound per ream, if produced on the dull surface at the lower speed, would be produced at rates of about 1 ton per square foot per day and about 66 horsepower-days per ton; on the medium surface, the rates would be about 0.95 ton per square foot per day and 73 horsepower-days per ton; and on the sharp surface, the rates would be about 0.18 ton per square foot per day and 120 horsepower-days per ton.

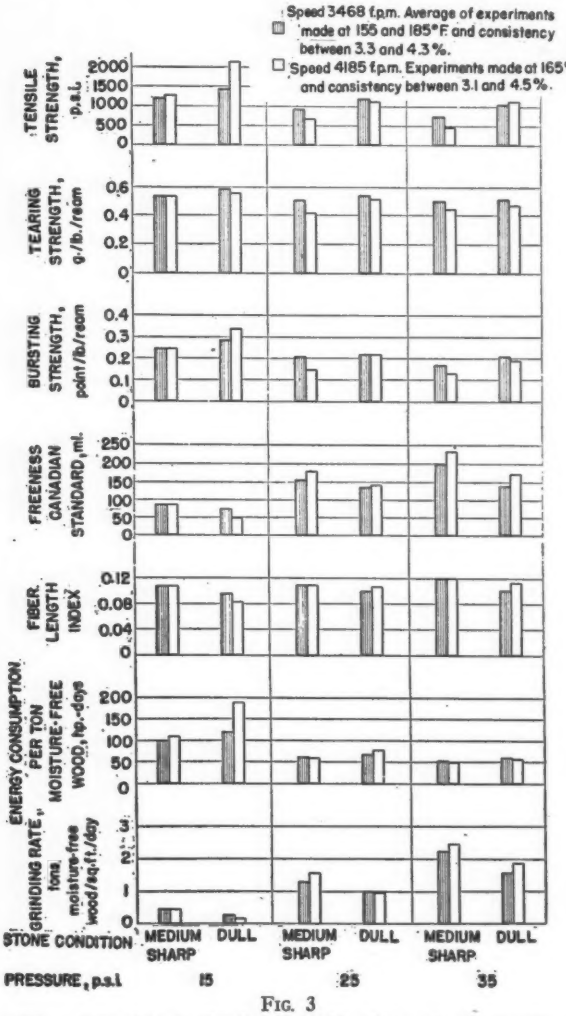

Speed 3468 f.p.m. Average of experiments made at 155 and 185°F and consistency between 3.3 and 4.3%.
Speed 4185 f.p.m. Experiments made at 165°F and consistency between 3.1 and 4.5%.
TENSILE STRENGTH, p.s.i.
TEARING STRENGTH, g./lb./ream
BURSTING STRENGTH, point/lb./ream
FREENESS CANADIAN STANDARD, ml.
FIBER LENGTH INDEX
ENERGY CONSUMPTION PER TON MOISTURE-FREE WOOD, hp.-days
GRINDING RATE, tons moisture-free wood/sq.ft./day
STONE CONDITION
MEDIUM SHARP
DULL
PRESSURE, p.s.i.
15
25
35

FIG. 3

Effect of Speed in the Grinding of Quaking Aspen at a Temperature of 165° F. and Consistency of 3.0 to 4.5%.

Comparison of Grinding Characteristics of Aspen and Spruce. The results of grinding aspen and spruce under the same conditions are given in Table V. It may be noted that the spruce pulps were generally higher than the aspen pulps in the amounts of fiber retained on the 24-mesh screen, but generally lower than the aspen in the amounts retained on the finer mesh screens and higher in the amounts passing the 150-mesh screen. The net result was that the average fiber-length, as represented by the fiber-length index, was always higher for the aspen than for the spruce.

Figure 5 shows grinding effects and pulp properties for the two woods when ground at the various stone-surface conditions. It is readily seen that under the same conditions of grinding, aspen grinds at a greater rate and with less energy consumption, but produces a higher freeness pulp of much lower strength. It is indicated that to produce pulps of equal strength, aspen would require much higher energy consumption than spruce.

Conclusions from Pulping Experiments

The pulping experiments indicate that with the kind and type of pulpstone and burr pattern used, a dull stone-surface condition is preferable to a sharp condition for the production of pulp from quaking aspen in the freeness range used for printing papers. At a given pressure, pulp of higher strength can be produced, and for a given quality, the production rate is higher and the energy consumption is lower on a dull than on a sharp stone-surface.

At a stone-surface speed of 3,468 feet per minute, the effect of increasing the grinding temperature from 125 to 155 to 185°F., with the consistency constant, was principally to increase the freeness of the pulp produced. The effect was less pronounced with a dull stone-surface condition than with a sharp one. At a stone speed of 4,185 feet per minute, there appeared to be no important effect on grinding characteristics nor on pulp properties that could be attributed to increasing the temperature from 150 to 165 to 185°F. or to increasing the consistency from about 2.0 to about 3.5 to about 5.0%.

Pulps produced at the two speeds, when compared

under the same stone-surface conditions, pressures, and temperatures, did not follow consistent trends in regard to pulp properties, energy consumption, and production rate, although higher stone speed favored higher freeness in the majority of cases. Comparison of the effects of the two speeds at equal stone-surface conditions and energy consumptions, however, showed that grinding rate and freeness are generally higher and the strength generally lower for the higher stone speed.

Comparison of spruce and aspen ground under the same conditions showed a higher energy consumption, a lower grinding rate, higher strength, lower freeness, and lower average fiber length for the spruce than for the aspen. It was indicated that to produce pulps of equal strengths, aspen would require much higher energy consumption than spruce.

Papermaking Experiments

Papermaking Equipment and Operation

The paper-machine runs were made on the Laboratory's 12-inch experimental fourdrinier machine under conditions approximating those found suitable for making satisfactory paper from standard commerical pulps. No attempt was made, however, to duplicate such operating conditions, exactly, but rather an effort was made to vary the conditions slightly to produce from the various pulps and furnishes tried, what was believed to be the best book sheet on the bases of sheet formation, finish, and control tests.

All runs were made at wire speed of about 80 feet per minute, and a nominal weight of 40 pounds (25- × 40—500) was chosen as the basis weight. An attempt was made to control sheet density by varying the wet-press and calender pressure, but because of the wide range of furnishes tried and the effect of the various types of aspen groundwood on sheet density, this was only partly successful.

When the desired operating conditions were established for each run a sufficient amount of paper was made for subsequent coating, supercalendering, and printing trials. Samples of each paper were obtained for physical tests, and head-box samples were taken at the end of each run for stock-freeness and consistency determinations.

Description of Pulps and Preparation of Furnishes

Each of the five aspen groundwood pulps used was a mixture of two pulps produced under comparable grinding conditions. Each mixture represented one of the five stone conditions used in part 2 of the pulping experiments. The experimental spruce groundwood pulp used was a mixture of three pulps produced at stone conditions A and B. The grinding conditions used, the pulp properties of the individual pulps, and the properties of the spruce pulp mixture are given in Table VI.

The chemical-pulp component for all runs was bleached sulphite (mainly spruce) obtained from a manufacturer of book-grade pulp. Book-grade groundwood composed of a mixture of spruce and aspen was also obtained from the same source for use in some of the furnishes.

All furnishes were prepared in the Laboratory's 50-pound capacity beater, and although no beating was given the pulps, sufficient circulating time was allowed to obtain a uniformly dispersed stock. Twelve per cent clay, 1% rosin size, and 2% alum were added to the furnishes. Sufficient sulphuric acid was added to obtain a pH of 5 in the beater, and this pH was also maintained on the paper machine during the runs by adding sulphuric acid continuously at the headbox.

Description of Machine Runs

A reference-standard run was made from commercial pulps (M. R. 2601). Since the commercial groundwood pulp used in this run contained a small

TABLE V.—COMPARISON OF ASPEN AND SPRUCE GROUNDWOOD PULPS PREPARED UNDER THE SAME CONDITIONS

Grinder Run No.	Species	Grinding Data: Wood Dryness, %	Pressure of Wood on Stone,[2] lb. per sq. in.	Temperature: Of Grinding, °F.	Temperature: Shower Water, °F.	Consistency, %	Stone Service Time,[3] hr.	Grinding Rate, Moisture-free Wood per 24 hr.,[4] tons	Power Input,[4] hp.	Energy Consumed per Ton Moisture-free Wood, hp.-days	Properties of Pulp Suspension: Freeness: Schopper-Riegler, ml.	Freeness: Canadian Standard, ml.	Screen Analysis, Retained Between: Retained on 24-mesh, %	24- and 42-mesh, %	42- and 80-mesh, %	80- and 150-mesh, %	Passing 150-mesh, %	Fiber Length Index	Properties of Pulp Test Sheets[1]: Bursting Strength 25×40—500, pt. per lb. per ream	Tearing Strength 25×40—500, gm. per lb. per ream	Tensile Strength: Lb. per sq. in.	Lb. per in. width	Density, g. per cc.	Brightness,[5] %
Series A[6]																								
420	Aspen	50.3	20	165	113	3.4	98	1.42	81	56	537	230	7.4	23.7	18.9	17.3	32.7	0.113	0.13	0.45	548	9.9	0.34	68.0
424	Spruce	82.9	20	165	90	3.5	107	1.01	79	78	243	55	7.0	13.3	14.5	19.8	45.4	.090	.35	.75	2,010	27.5	.44	59.8
Serie. B[6]																								
425	Aspen	...	20	165	90	3.8	174	1.07	71	68	463	168	3.1	18.9	19.6	17.3	41.1	.097	.16	.48	856	14.5	.38	66.6
432	Spruce	82.9	20	165	70	3.4	192	.69	69	100	228	23	5.9	15.2	11.2	20.4	47.3	.088	.42	.78	2,300	31.4	.46	59.0
Series C[6]																								
436	Aspen	...	20	165	85	3.7	222	.96	74	77	412	113	1.2	19.2	17.0	21.8	40.8	.096	.19	.44	970	16.2	.38	64.2
439	Spruce	...	20	165	70	3.3	225	.64	67	104	205	20	7.2	13.0	12.5	21.1	46.2	.089	.45	.72	2,680	33.7	.48	59.5
Series D[6]																								
457	Aspen	...	20	165	70	3.9	278	.81	69	84	405	118	1.9	12.6	25.0	18.2	42.3	.094	.24	.50	1,358	19.4	.42	58.0
460	Spruce	...	20	165	60	3.5	281	.60	68	115	200	15	3.1	10.0	17.2	21.1	48.6	.085	.38	.62	2,520	30.8	.49	58.4
Series E[6]																								
466	Aspen	65.7	20	165	75	3.3	349	.60	60	101	350	95	.5	8.0	27.3	15.8	48.4	.086	.27	.58	1,670	23.4	.43	60.4
464	Spruce	89.5	20	165	58	2.9	340	.32	51	157	140	10	2.6	9.7	15.7	18.2	53.8	.081	.48	.65	3,350	39.7	.52	57.8

[1] Basis weight of test sheets, 115 pounds per ream.
[2] Actual thrust of the pressure foot (determined by calibration of the cylinder pressure) divided by the area represented by the product of the pocket width and wood length.
[3] A Norton stone 3760/5N7 was used. Stone service time at the start of each run is the accumulative hours of operation (based on three-pocket operation at 3,150 feet per minute) since burring with a 10-cut, 1½-inch lead, spiral burr and a 14-point diamond burr. Peripheral speed used in the experiments was 4,185 feet per minute with three pockets in use simultaneously. Stone immersion was 9 inches.
[4] Per square foot of wood-stone contact area.
[5] Measured with Hunter reflectometer calibrated in accordance with TAPPI method T-217 sm-42.
[6] Series A, B, C, D, and E were made on a progressively duller stone surface. The surface for A was considered fairly sharp, that for E was dull.

but unknown amount of aspen groundwood another run (M. R. 2622), was made for an additional comparison in which the commercial groundwood was replaced with spruce groundwood prepared at the Forest Products Laboratory. Each of the five experimental aspen groundwood pulps was used in three different furnishes. These furnishes were chosen to determine (1) whether or not any deficiencies in sheet characteristics resulting from the use of the various aspen groundwood pulps could be counterbalanced by changing slightly the chemical-pulp component, and (2) to obtain a better indication of the effect of using aspen groundwood pulps of different qualities. The data for these furnishes are given in Table VII.

Discussion of Papermaking Experiments

Since but one run was made on each of the furnishes just described, it was possible to obtain indicative information only, and the observations made during the runs and the conclusions drawn from analysis of the test data can only represent general trends that may be expected. It was observed that the use of aspen groundwood in these furnishes tended to produce a relatively low wet-web strength that required greater care in the adjustment of the draws between sections of the paper machine. It was also observed that although excellent formation was relatively easy to obtain, the drainage of water on the wire was slow and the wet-web was easily marked by the felts. More picking at the presses and on the driers was noticed when the higher percentages of aspen groundwood were used, and this tendency was increased with the use of the higher freeness groundwood pulps. However, no appreciable changes in operating conditions were required throughout the series of runs, and except for more precise control requirements, it was concluded that no great difficulty would be encountered in running any of these furnishes on commercial equipment.

Results of tests on the various experimental papers are also given in Table VII. The values obtained for the reference run (M. R. 2601) approximate those obtained on samples of commercial book paper made from a similar furnish. The all-spruce sheet (M. R. 2622) had a little lower density, about 60% more tearing strength, and was considerably more porous than the reference-standard sheet.

Effect of Aspen Groundwood on Certain Sheet Properties of Book Paper

Density. Without exception, the density of the papers containing the experimental aspen groundwood pulps was appreciably higher than that of the reference sheet. Since this was true even when very high-freeness groundwood was used (M. R. 2610, M. R. 2626, and M. R. 2624), it appeared that this characteristic could be attributed directly to the aspen fiber. It was interesting to note, however, that the lowest-freeness groundwood (series E), did not produce the highest density paper, but rather the opposite. This might be attributed to the fact that less jordaning of the stock was required to obtain a satisfactory sheet than when higher-freeness groundwood was used.

Bursting strength. The bursting strength of the aspen groundwood papers made with the same fur-

TABLE VI.—ASPEN AND SPRUCE GROUNDWOOD PULPS USED IN EXPERIMENTAL PAPER MACHINE RUNS

Grinder Run No.	Species	Grinding Data: Wood Dryness, %	Pressure of Wood on Stone,[2] lb. per sq. in.	Temperature: Of Grinding, °F.	Temperature: Shower Water, °F.	Consistency, %	Stone Service Time,[3] hr.	Grinding Rate Moisture-free Wood per 24 hr.,[4] tons	Power Input,[4] hp.	Energy Consumed per Ton Moisture-free Wood, hp.-days	Properties of Pulp Suspension: Freeness: Schopper-Riegler, ml.	Freeness: Canadian Standard, ml.	Screen Analysis: Retained on 24-mesh, %	Retained Between: 24- and 42-mesh, %	Retained Between: 42- and 80-mesh, %	Retained Between: 80- and 150-mesh, %	Screen Analysis: Passing 150 mesh, %	Fiber Length Index	Properties of Pulp Test Sheets[1]: Bursting Strength 25×40—500, pt. per lb. per ream	Tearing Strength 25×40—500, gm. per lb. per ream	Tensile Strength: Lb. per sq. in.	Tensile Strength: Lb. per in. width	Density, g. per cc.	Brightness,[5] %
Series A[6]																								
422	Aspen	50.3	15	165	95	3.8	103	0.91	62	69	463	188	3.8	22.1	20.2	17.5	36.4	0.105	0.16	0.43	704	12.4	0.35	68.2
423	Aspen	47.3	15	165	98	3.8	105	1.01	66	65	483	203	4.4	23.5	18.1	17.6	36.4	.106	.17	.42	794	12.7	.37	63.6
424	Spruce	82.9	20	165	90	3.5	107	1.01	79	78	243	55	7.0	13.3	14.5	19.8	45.4	.090	.35	.75	2,010	27.5	.44	59.8
Series B[6]																								
428	Aspen	. .	15	165	75	3.5	180	.49	48	97	412	108	1.6	19.4	15.1	20.6	43.3	.087	.20	.54	1,112	17.3	.39	69.0
429	Aspen	.	15	165	80	3.5	183	.57	53	93	407	103	1.1	20.6	18.1	21.4	38.8	.099	.20	.55	1,142	18.8	.39	62.2
432	Spruce	82.9	20	165	70	3.4	192	.69	69	100	228	23	5.9	15.2	11.2	20.4	47.3	.088	.42	.78	2,300	31.4	.46	59.0
433	Spruce	82.9	25	165	..	3.5	213	...	...	...	235	27	4.5	11.8	12.2	18.9	52.6	.082	.39	.66	2,510	31.3	.46	59.8
(7)	Spruce	...	..	...	...	..	...	...	...	...	285	47	4.3	12.4	15.5	19.4	48.4	.086	.37	.64	2,425	32.2	.47	60.7
Series C[6]																								
434	Aspen	...	15	165	73	3.3	217	.43	48	111	378	88	.1	14.8	18.9	22.5	43.7	.091	.25	.50	1,293	19.9	.44	66.8
435	Aspen	...	15	165	75	3.7	220	.50	50	98	378	98	.1	13.2	18.9	20.3	47.5	.086	.24	.53	1,370	19.4	.43	63.0
Series D[6]																								
457	Aspen	..	20	165	70	3.9	278	.81	69	84	405	118	1.9	12.6	25.0	18.2	42.3	.094	.24	.50	1,358	19.4	.42	58.0
458	Aspen	...	20	165	70	3.9	279	.86	66	78	347	92	2.0	6.6	22.5	20.2	48.7	.084	.24	.47	1,581	21.8	.45	59.6
Series E[6]																								
466	Aspen	65.7	20	165	75	3.3	349	.60	60	101	350	95	.5	8.0	27.3	15.8	48.4	.086	.27	.58	1,670	23.4	.43	60.4
467	Aspen	. .	20	165	60	3.8	351	.61	63	103	300	80	.3	4.9	23.5	17.3	54.0	.079	.27	.46	1,632	21.2	.44	59.4

[1] Basis weight of test sheets, 115 pounds per ream.
[2] Actual thrust of the pressure foot (determined by calibration of the cylinder pressure) divided by the area represented by the product of the pocket width and wood length.
[3] A Norton stone 3760/5N7 was used. Stone service time at the start of each run is the accumulative hours of operation (based on three-pocket operation at 3,150 feet per minute) since burring with a 10-cut, 1½-inch lead, spiral burr and a 14-point diamond burr. Peripheral speed used in the experiments was 4,185 feet per minute with three pockets in use simultaneously. Stone immersion was 9 inches.
[4] Per square foot of wood-stone contact area.
[5] Brightness measured with Hunter reflectometer calibrated in accordance with TAPPI method T-217 sm-42.
[6] Series A, B, C, D, and E were made on a progressively duller stone surface. The surface for A was considered fairly sharp, that for E was dull.
[7] Mixture of 31% of pulp from grinder run No. 424, 27% from No. 432, and 42% from No. 433.

nish as the reference standard (namely, 60% groundwood and 40% sulphite), ranged from 48 to 73% of the strength of the reference standard. The lowest strength was obtained in the sheet (M. R. 2610), made from the highest-freeness groundwood produced in series A on a sharp stone. The groundwood made with medium-sharp and medium-dull stone conditions in series C and D, respectively, produced paper having the highest bursting strength in all three of the furnishes tried. When 50% sulphite and 50% of series C groundwood was used (M. R. 2634), nearly 90% of the bursting strength of the reference standard was obtained.

An interesting comparison may be made between the all-spruce sheet (M. R. 2622) and the papers in which series C and D aspen groundwood was substituted for half the spruce groundwood, (M. R. 2632 and M. R. 2759) in which the bursting strength was higher than that obtained in the all-spruce paper.

Tearing strength. The tearing strength of the papers made with 60% aspen groundwood was in general relatively low, and although two runs (M. R. 2633 and M. R. 2763) had higher strength than the reference standard, the highest was only 72% of the tearing strength of the all-spruce sheet. When the sulfite component was increased to 50%, some improvement was obtained in tearing strength, as was expected. The same trend was observed in the furnishes using 30% aspen and 30% spruce groundwood.

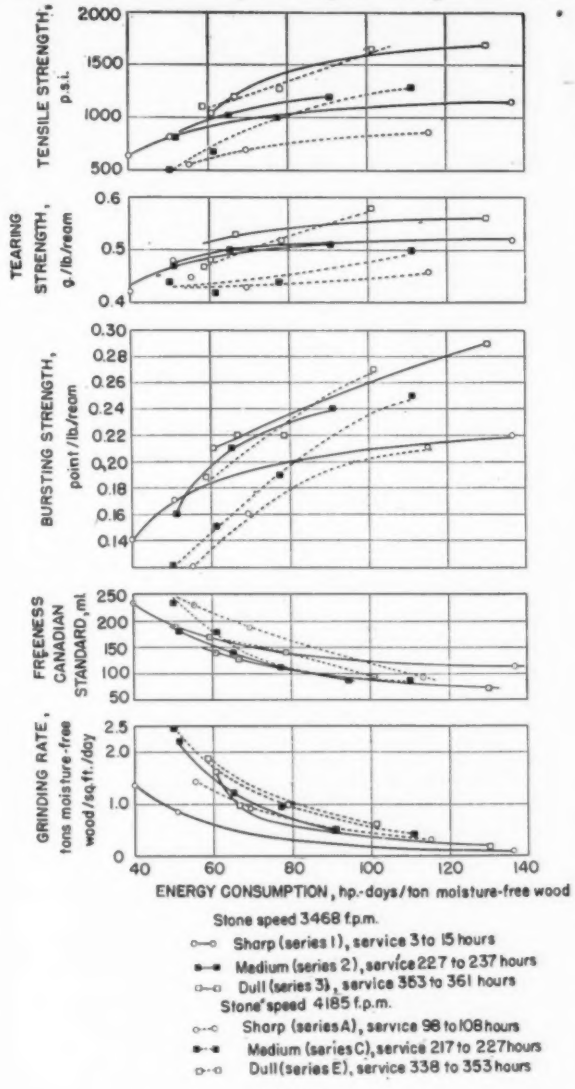

TENSILE STRENGTH, p.s.i.
TEARING STRENGTH, g./lb./ream
BURSTING STRENGTH, point/lb./ream
FREENESS CANADIAN STANDARD, ml
GRINDING RATE, tons moisture-free wood/sq.ft./day
ENERGY CONSUMPTION, hp.-days/ton moisture-free wood
Stone speed 3468 f.p.m.
Sharp (series 1), service 3 to 15 hours
Medium (series 2), service 227 to 237 hours
Dull (series 3), service 353 to 361 hours
Stone speed 4185 f.p.m.
Sharp (series A), service 98 to 108 hours
Medium (series C), service 217 to 227 hours
Dull (series E), service 338 to 353 hours

FIG. 4

Relationship of Energy Consumption to Grinding Rate and Pulp Properties in the Grinding of Quaking Aspen.

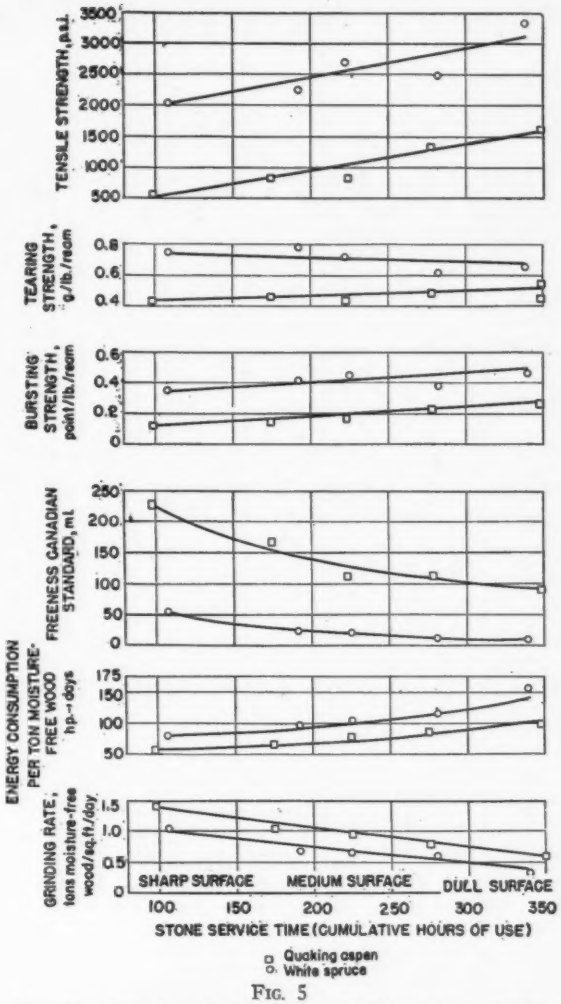


FIG. 5

Comparison of the Groundwood Pulping of Quaking Aspen and White Spruce at a Surface Speed of 4,185 Feet Per Minute, Temperature of 165° F., Pressure of 20 p.s.i. of Wood on Stone, and Consistency of 2.9 to 3.7%.

Tensile strength. The tensile strength of the various aspen groundwood papers was, in general, higher than that of the reference standard except for those made with the relatively free pulp produced on a sharp stone surface. The tensile strength obtained in machine run 2760 was nearly 30% higher than the reference standard. It was interesting to note that the series E aspen pulp, which had the highest tensile strength and the lowest freeness, did not produce the highest strength in the paper.

Porosity and opacity. In most instances, the porosity and opacity of the papers made with the aspen groundwood pulps were lower than those of the all-spruce sheet and the reference standard. A noteworthy exception was observed in the sheet from machine run 2763 made with series E groundwood where the opacity was 96% and the porosity 35 seconds as compared to 95% and 42 seconds for the all spruce sheet.

TABLE VII.—DATA ON BOOK PAPERS MADE WITH FOREST PRODUCTS LABORATORY EXPERIMENTAL ASPEN GROUNDWOOD PULPS

Machine Run No.	Groundwood Series	Groundwood No.	Groundwood Freeness (C.S.), ml.	Ream Weight (25×40—500), lb.	Thickness, mils.	Density, g. per cc.	Bursting Strength, pts. per lb. per ream	Tearing Strength, g. per lb. per ream	Tensile Strength, lb. per sq. in.	Porosity, sec.	Castor Oil Penetration, sec.	Size No.	Gloss, %	Opacity, %	Brightness (G.E. equivalent), %	Ash, %	Headbox Consistency, %	Headbox Freeness (S.-R.), ml.
Reference Standard—60% commercial groundwood,[1] 40% commercial bleached sulphite[2]																		
2601	Reference standard	Shipment 2230 (100% Softwood Sheet)	43	39.8	3.2	0.69	0.26	0.52	1955	89	90	0.7	34.0	95	61.5	8.5	0.57	350
60% Forest Products Laboratory spruce groundwood, 40% commercial bleached sulphite																		
2622	F.P.L. spruce groundwood	424, 432, 433	35	41.2	3.49	.65	.24	.83	1839	42	45.6	.6	36.0	95	65.0	7.7	.54	405
60% aspen groundwood, 40% commercial bleached sulphite																		
2610	A	422-23	195	38.9	2.90	.74	.12	.40	1405	91	67	1.1	40	91	70.8	8.5	.43	405
2630	B	428-29	105	39.9	2.76	.80	.16	.48	1756	75	115	.80	40	93	67.0	7.7	.50	375
2633	C	434-35	93	40.6	2.83	.79	.19	.58	2090	60	87	.40	39	92	68.0	7.7	.50	450
2760	D	457-58	105	39.6	2.70	.81	.19	.41	2523	143	103	1.4	41	93	61.1	9.1	.44	330
2763	E	466-67	87	40.2	3.10	.72	.15	.60	1823	35	48	.31	34	96	63.7	8.6	.48	425
50% aspen groundwood, 50% commercial bleached sulphite																		
2626	A	422-23	195	40.2	2.71	.82	.18	.56	2043	82	100	.60	44	91	70.0	8.3	.48	450
2631	B	428-29	105	41.3	2.89	.79	.20	.59	1859	53	49	.89	39	94	66.0	7.8	.48	500
2634	C	434-35	93	42.8	2.74	.86	.23	.65	2443	110	85	.40	42	93	66.6	8.0	.43	440
2761	D	457-58	105	41.5	2.6	.88	.20	.41	2852	265	116	1.0	38	93	60.1	9.8	.60	320
2764	E	466-67	87	40.9	2.8	.81	.19	.59	2388	70	55	.63	38	93	64.0	9.0	.51	460
30% aspen groundwood, 30% Forest Products Laboratory spruce groundwood, 40% commercial bleached sulphite																		
2624	A	422-23	195	39.9	2.95	.75	.16	.54	1579	60	92	.76	39	93	68.0	8.2	.49	385
2628	B	428-29	105	40.7	2.75	.82	.17	.47	1974	114	110	.85	42	94	65.0	9.1	.54	365
2632	C	434-35	93	40.8	2.64	.85	.25	.63	2925	119	89	.60	40	92	65.0	8.3	.44	405
2759	D	457-58	105	41.1	2.50	.91	.29	.38	3620	440	173	1.6	47	95	61.4	10.2	.59	310
2762	E	466-67	87	43.3	3.10	.77	.18	.57	2013	73	60	.40	38	96	60.4	8.8	.51	375

[1] Groundwood composed of a mixture of aspen and spruce, percentages unknown (shipment No. 2230).
[2] Mainly spruce (shipment No. 2231)

Conclusions from Papermaking Experiments

Aspen groundwoods having a wide range of properties can be used in the book furnishes described without requiring appreciable changes in paper-machine operating conditions.

The density of the papers made with the aspen groundwood pulps was higher than that of the reference-standard run and of the all-spruce sheet.

The relatively high-freeness and low-strength aspen groundwood made on a sharp stone surface produced the lowest-strength paper.

Aspen groundwoods produced on medium-sharp and medium-dull stone surfaces and having moderately high strengths produced papers having the highest tensile and bursting strengths regardless of the furnish used.

In most instances, the opacity of the papers made with aspen groundwood was less than that of the reference-standard and of the all-spruce sheets.

Coating, Supercalendering, and Printing Trials

Some of the papers made in the experiments described above were tested for coating, supercalendering, and printing characteristics in the laboratory of a commercial book-paper manufacturer. The results of these tests indicated that the aspen groundwood did not impair the printability of the paper. However, the relatively low strength and high density of the papers were somewhat objectionable characteristics since the low strength would tend to cause breaks during printing and the high density would reduce the amount of coating that could be applied to the sheet. It was concluded that these objectionable characteristics could be overcome to a satisfactory degree by adjusting the proportional amounts and the types of pulps in the furnish.

Literature Cited

1. Munro, W. A., 1923 Poplar wood as a substitute in the manufacture of groundwood. *Paper Trade J.* 77, No. 20: 60.
2. Running, K. D., 1941 Hardwood utilization by the paper industry. *Pulp Paper Mag. Canada* 42, No. 2: 104-106 (Convention issue).
3. Thickens, J. H., and McNaughton, G. C., 1916 Groundwood pulp. U. S. Dept. of Agriculture Bulletin 343
4. Wynn-Roberts, R. I., 1937 Grinding characteristics of various woods. *Paper Trade J.* 104, No. 6: 46-48.

New TAPPI Members

The Executive Committee of the Technical Association of the Pulp and Paper Industry has elected the following to membership:

John J. Austin, Manufacturer's Representative, Austin Industries, Concord, Massachusetts. Attended Boston University and the Massachusetts Institute of Technology.

Paul E. Barr, Process Engineer, Rayonier, Inc., Hoquiam, Washington, a 1935 graduate of Iowa State College.

Arthur P. Bellinghausen, Technical Superintendent, Kimberly-Clark Corp., Kimberly, Wisconsin, a 1936 graduate of Marquette University.

Cornelius Betten, Jr., Research Department, Champion Paper & Fibre Co., Canton, North Carolina, a 1936 Ph.D. graduate of Cornell University.

John G. L. Caulfield, Assistant Technical Director, Eastern Corporation, Bangor, Maine, a 1926 M.S. graduate of the University of Maine.

William F. Long, I/c Paper Quality Control Laboratory, International Business Machines Corp., Endicott, New York, a 1940 graduate of Georgia School of Technology.

Mervin E. Martin, Superintendent, Celanese Corp. of America, Cumberland, Maryland. Attended the University of Maryland.

Joseph V. Mason, Plant Manager, Tarentum Products Corp., Tarentum, Pennsylvania.

R. Burke Morden, Vice-President, Morden Machines Co., Portland, Oregon, a 1936 graduate of the University of Oregon.

Bjarne T. Nyman, Mill Superintendent, O/Y Kyro A/B, Kyroskoski, Finland, a 1937 graduate of the Technical University of Finland.

LeRoy C. Watson, Technical Sales, The Hubinger Co., Keokuk, Iowa, a 1933 graduate of the University of Iowa.

Pacific TAPPI Meets at Longview

Fresh from vacations at the beautiful beaches of Oregon and Washington or the incomparable mountain resorts in the snow-capped Cascades, one hundred and fifty members and friends of TAPPI gathered in Longview, Washington for the first Pacific Section Meeting of the 1947-48 season. Longview Fibre Co. and the Pulp Division, Weyerhaeuser Timber Co., Longview, acted as joint hosts for the occasion.

The technical program began at 2:00 p. m. at the Longview Women's Club. Dr. J. L. McCarthy, Department of Chemistry and Chemical Engineering, University of Washington and Chairman of Pacific Section, called the gathering to order and introduced Paul S. Billington, Research Dept., Weyerhaeuser Timber Co., Pulp Division. Mr. Billington then presented to the group M. W. Bray, Forest Products Laboratory, Madison, Wis. Mr. Bray's paper "Pulping of Dead Lodgepole Pine" gave interesting data on the yield, physical and chemical characteristics, and utility of pulp made by the kraft process from several types of lodgepole pine. He pointed out the comparison between pulp made from sound, green timber, sound, dead and insect infested, dead timber and showed that good pulp can be produced in each case. Mr. Bray's work offers interesting possibilities for the utilization of dead timber which would not only produce saleable pulp but would also make possible the clearing up of land for reforestation projects.

Robert V. Pazina, Fir-Tex Insulating Board Co., St. Helens, Ore. presented the first paper of the year in competition for the Shibley Award. Entitled "Insulating Board Handsheets," his paper described the method of preparing handsheets of various insulating board furnishes, the physical tests which are applied to such sheets, and how the information obtained is used in the mill operation. Mr. Pazina has found that the tensile strength of insulating board is a function of the density of the board and also of the thickness and so-called skin effect. Laboratory handsheets may be used to advantage in obtaining useful and fairly accurate information about the board before manufacture.

The remainder of the afternoon was given over to a panel discussion of chipping under the direction of R. N. Hammond, Weyerhaeuser Timber Co., Pulp Division, Longview, Wash.

Mr. Lester Johnson, chief engineer, Soundview Pulp Co., Everett, Wash., opened the symposium with a paper on the types, operation, and power requirements of the various types of chippers in use by the industry today. He outlined in detail the several factors affecting the quality of chips such as knife arrangements, vertical and horizontal knife angles, multiple knife chippers, power requirements, construction materials, etc. Mr. Johnson's paper provided an excellent background for the discussion to follow.

Mr. Oliver Morgan, Pulp Division, Weyerhaeuser Timber Co. then discussed the next phase of the operation in his paper on "Chip Handling and Sampling." In the paper Mr. Morgan described in detail the new chip handling and storage system in use at the Weyerhaeuser Longview mill which has recently been rebuilt. He explained how representative chip samples are taken and tested, and how the test results are applied to maintain uniform digester loading and uniform pulp.

Mr. Richard Wollenberg, Chief of the Engineering Division, Longview Fibre Co., described the method in use at this mill for handling and storing chips in railroad cars. He explained that when chips are purchased from outside sources, such as saw mills, and where company trackage and company owned equipment can be utilized, the use of railroad cars for moving and storing chips is a satisfactory and economical method of doing the job.

The final paper of the afternoon covering the effect of chip quality on pulp quality was presented by W. F. Holzer, Central Technical Department, Crown Zellerbach Corp., Camas, Wash. Dr. Holzer pointed out the importance of the elimination of dirt by proper chip screening to remove sawdust. The importance of chip moisture content was discussed, 35 to 40% being the optimum. The effect of higher moisture which causes acid dilution and lower moisture which results in uneven penetration and cooking was explained. Dr. Holzer further reported on the effect of chip damage from brusing in the chipping operation and its effect on pulp quality. A series of tests were made by the Central Technical Department in which chips were produced by hand and pulped by the standard sulphite process. Sulphite pulp from such undamaged chips is of much higher quality than that made from commercial chips. In some instances this pulp actually approached kraft pulp in certain strength characteristics. In concluding, Dr. Holzer explained what can practically be done in minimizing chip damage by frequent knife sharpening and knife design.

The meeting adjourned to the Hotel Monticello where a social hour was provided by the Longview hosts. This was followed by a dinner and some excellent entertainment by John L. Heydon, a local magician. A film on sports concluded the meeting.

Among those attending were:

G. F. Alcorn, Longview; C. A. Anderson, Camas; Clarence H. Anderson, Shelton; Leslie L. Anderson, Longview; E. Clinton Ash, Jr., Camas; Berry W. Bailey, Everett; Paul E. Barr, Hoquiam; C. T. Beals, Camas; Paul S. Billington, Longview; L. H. Blackerby, Portland; E. D. Boelter, Camas; Mark W. Bray, Madison; Ben T. Briggs, Shelton; F. Cecil Brown, Port Townsend; J. Harold Brown, Longview; J. R. Brown, Jr., Seattle; Ray Brown, St. Helens; R. E. Brown, Hoquiam; Robley Butler, Camas.

Frank C. Caskey, Camas; Carl C. Castle, Seattle; Ken Chapman, Everett; E. Christoferson, Everett; Dudley F. Church, Camas; Wm. W. Clarke, Longview; C. W. Cutler, Seattle; R. E. Dana, Longview; Harold A. Deery, Longview; E. F. Drake, Port Townsend; J. G. Ellis, Olympia; G. V. Emerson, Port Aownsend; A. E. Erickson, Longview; E. O. Ericsson, Bellingham; Carl Fahlstrom, Longview; W. L. Failing, St. Helens; Claude L. Fargo, Longview; H. B. Fenn, Jr., Portland; E. N. Fitting, Seattle; F. W. Fylnn, Camas; Gordon L. Frederic, Longview; David C. Fulton, Portland.

Irving R. Gard, Seattle; Wm. R. Gibson, Seattle; Paul L. Gilmont, Shelton; W. G. Goodwin, Camas; J. K. Gould, Longview; Alfred Graef, Everett; Howard Graham, Camas; Richard F. Graham, Longview; Kenneth L. Hackett, Longview; Brice Hammack, St. Helens; R. N. Hammond, Longview; John F. Hart, Longview; R. S. Hatch, Longview; W. H. Haverman, Longview; S. E. Hazelquist, Longview; Arnold Hegg,

Hoquiam; R. M. Henry, Tacoma; H. R. Heuer, Longview; Henry Hoegg, Hoquiam; W. F. Holzer, Camas; R. B. Honeyman, Portland; John F. Hooper, Shelton; Otto L. Hudrlik, Portland; Albert M. Hughes, Shelton; J. H. Hull, Camas.

E. R. Johnson, Everett; Joel B. Johnson, Longview; Lester M. Johnson, Everett; Wilfred A. Jordan, Longview; M. C. Kaphingst, Vancouver; Louis S. Keyser, Shelton; John W. Klein, Longview; John D. Knopp, Longview; H. C. Lee, Portland; Clark Lewis, Longview; C. N. Linden, Everett; Edward G. Locke, Portland; J. G. Long, Longview; Joseph L. McCarthy, Seattle; John M. McEwen, Longview; W. A. McKenzie, Shelton; John J. McNair, Longview; J. Walter Mackem, Olympia; Milton J. Maguire, Portland; T. S. Markov, Stockton; F. P. Marren, Longview; Vern Mauerman, Longview; G. T. Mickel, Shelton; T. R. Miles, Coos Bay; George E. Miller, Vancouver; R. Burke Morden, Portland; Howard Morgan, Longview; O. P. Morgan, Longview.

J. Neilsen, Portland; George O. Nelson, Empire; Max R. Oberdorfer, St. Helens; C. G. Onstad, Shelton; E. T. Parker, Camas; E. V. Partlow, Shelton; Robert V. Pazina, St. Helens; Virgil Peters, Longview; H. T. Peterson, Longview; S. Posen, Shelton; George P. Robbins, Longview; John E. Robison, St. Helens; John W. Schuh, Longview; Leon E. Semke, Camas; Roy Shaneman, Portland; W. J. Shelton, Longview; Brian Shera, Tacoma; L. R. Sherlock, St. Helens; E. C. Sherman, Port Townsend; A. P. Siebers, Longview; Ray Smythe, Portland; M. F. Stewart, Longview; R. E. Strommer, Longview; V. M. Sutherling, Longview.

Peter P. Taranoff, St. Helens; R. I. Thieme, Everett; Paul J. Thiess, Portland; Berwyn B. Thomas, Shelton; E. D. Thomson, Tacoma; P. M. Toppari, Shelton; R. M. True, Portland; Hugo Trygg, Longview; W. G. Van Beckum, Longview; Preston Varney, Longview; R. O. Vognild, Tacoma; H. Jay Wagner, Longview; H. C. Wall, Longview; Fred J. Weleber, Oregon City; E. N. Wennberg, Vancouver; O. C. Wheeler, Camas; Lester P. White, Longview; Wallace E. White, Longview; R. P. Wollenberg, Longview; Herb Wymore, Camas; T. R. Zegree, Camas.

Quality Control Course at Iowa

Executives and technical men from industry are being sent special invitations to attend an intensive training course dealing with "Quality Control by Statistical Methods." This course offered by the University of Iowa from October 28 to November 7 is the fifth such course offered by them in the past 3 years. The plan for the course calls for an opening day designed especially for executives of management level. The remainder of the course will consist of intensive instruction by means of lectures, laboratory work, and conferences for workers.

The instructional staff that will conduct the course will be composed of numerous specialists who names are becoming well known in this rapidly expanding field. Of especial interest to the pulp and paper industry is the fact that Dr. Carl E. Noble, Quality Methods Engineer, Kimberly-Clark Corporation will be a member of the staff.

Pacific TAPPI to Meet at Everett

The TAPPI Pacific Section will meet at Everett, Wash., on November 4th. The program will include a Shibley Award paper and a panel discussion on Laboratory "Gadgets" under the direction of Harold C. Wall of the Longview Fibre Company.

Maine-New Hampshire TAPPI at Madawaska

The fall meeting of the Maine-New Hampshire Section of the Technical Association of the Pulp and Paper Industry was held at Madawaska, Maine and Edmundston, N. B., with the Fraser Papers, Ltd., as hosts. E. L. Lamb of the Oxford Paper Company is Chairman of the Section. T. M. Barry, M. Barsilou and E. J. Ferrell of the Fraser Companies constituted the committee on local arrangements. F. A. Strovink of the American Cyanamid Company was chairman of the golf tournament committee. About 70 attended.

This program departed from the usual practice of the Section meetings in that no technical papers were presented. Guided tours were made through the Fraser mills in Edmundston and Madawaska where there was much of interest to be seen, including much new construction. The steam generating plant at Edmundston is one of the most recent developments of its kind.

On Friday evening, following the dinner, the principal speaker was G. P. Burchill, a member of the Canadian Senate. Mr. Burchill discussed the history and importance of forest conservation in the Province of New Brunswick. The paper industry was started in New Brunswick in 1890 at Catham, N. B. by Snowland Company. This was called the Maritime Sulphite Company. Wood at that time cost $2.50 per cord, delivered. At the present time the wood using industries have developed to a point where there is a dangerous shortage of wood. Methods of obtaining wood need to be changed to provide sustained yield in the future.

Mr. Burchill was introduced by Mr. Aubrey Crabtree of the Fraser Companies who also extended a hearty welcome to the members of the Section.

R. G. Macdonald, Secretary-Treasurer of the Technical Association was present and reported briefly on the Fundamental Research Meeting held at Appleton, Wis., and reviewed some interesting facts concerning the other fall meetings to be held at Syracuse, Alton, Asheville and Philadelphia.

On Saturday a visit was made to the woods operation of the Fraser Companies Ltd. in New Mrunswick.

Standards Costs for Manufacturing

The McGraw Hill Book Company has just issued "Standards Costs for Manufacturing" by Stanley B. Henrici (289 pp. 6 x 9).

The author's purpose is to explain standard costs from the ground up. It is presumed that the reader has studied general cost accounting to some extent.

Among the subjects covered are: What standard costs are; Setting up of accounts; Developing standard costs; The cost-comparison sheet; Setting standards for direct and indirect labor; Setting standards for materials; Setting standards for maintenance and other services; Setting standards for fuel and power; General overhead; Applying the standards to operations; Accounting for standard costs; Introduction to variance analysis; Variances in labor costs, materials cost, service and overhead costs; Budgets; Supervisors' incentive plans; Job Evaluation; Cost estimating and selling prices.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 E. 42nd Street, New York 17, N. Y., at $3.50 per copy.